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ORIGINAL ARTICLES.

THE EPIDEMIC INFLAMMATORY NEUROSIS; OR, NEUROTIC INFLUENZA.

Read before the St. Louis Medical Society, January 30, 1892.

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Certainly sufficient clinical experience has now been obtained by reliable observers the world over to assign to the prevailing epidemic of influenza a place among the inflammatory neuroses. French, English, German, Italian, Russian, and American writers have noted the prominence, and often persistence of the nervous symptoms, discussing them generally as *sequelæ*. The initial and concomitant symptoms of influenza are so markedly those of a toxic inflammatory neurosis expending itself chiefly on the nerve coverings, nerve endings, and mucous membranes, that this aspect of its symptomatology and pathology will probably not be gainsaid by any one. The nerve centers, too, are so plainly involved as to need no proof other than what has been already offered by general clinical experience, so that its neuropathic and psychopathic accompaniments and sequences are the conditions obviously to be combated. It is a disease in the management of which the diagnostic and therapeutic experience of the neurologist and the alienist ought not to be ignored.

Dr. George H. Savage, whose long experience in the observation and treatment of the insane qualifies him to speak advisedly of what he has observed of this epidemic, says: "Influenza, like other fevers, may set up psychopathy. Insanity may come on at various periods of the disease. It may start any form of insanity. It may be the predisposing or exciting cause." He thinks in all cases there is some acquired or inherited predisposition. "The insanity follows from altered brain nutrition, possibly toxic. The onset of insanity is often sudden, and bears no relationship to the severity of the influenza."

While another English alienist, equally eminent, notes that the epidemic appears of a very virulent type, the mortality being very high, especially among the profoundly nerve-exhausted general paralytics of his famous institution at Morningside. Dr. Thomas Aitken, Medical Superintendent at Invernes, thus describes the effect of the epidemic fever among his patients:

"* * * In five of the cases there were distinct mental symptoms. In two of the attendants there was wandering, and for one night a condition bordering on delirium; whilst an old epileptic, who refused her food, believing that poison was introduced into it, became restless and suspicious; another, an aged woman of a pleasing and gentle nature, recently admitted, who had previously suffered an attack of influenza in another asylum, became a profound melancholic; whilst the unsettled condition of another female patient passed into active excitement, which passed away with the attack."

In *Allgemeine Zeitschrift für Psychiatrie* (xvii, Band, 1 and 2 Heft.) Professor Kirn, of Freiburg, concludes "that influenza is a more frequent exciting cause of insanity than any other febrile affection." He has collected fifty-four instances observed by himself or other physicians. He classifies the cases which pass into insanity under two heads: 1. Where delirium occurs during the febrile condition of influenza. This frequently accompanies pneumonia. There are delusions and hallucinations, strange dreams, shouting of a joyous character, or howlings and lamentations. In one case, a boy of 7 years, the influenza commenced with mental aberration, the child wandering away without knowing where he was going. Patients affected with delirium during the course of the influenza were rarely found to have any hereditary predisposition to insanity. The patient generally recovered from the mental derangement in a few weeks. In the second, or post febrile form, Dr. Kirn had the details of thirty-nine cases. The insanity generally appeared in from four to eight days after the cessation of the fever. In two it came on as late as three weeks after. From the clinical symptoms he divides them into three forms, characterized by the conditions of mental exhaustion, melancholia, and mania. The exhaustion is of the same character as those cases in which the constitution of the patient has been reduced by fevers to the puerperal state. There is excitement suddenly appearing, with confusion of the senses, and a tendency to depression, with delusions of a dismal character. If the delirium becomes higher, there are delusions of the senses, rapid changes of mood, and tormenting thoughts. The bodily condition is one of weakness and anæmia. Recovery generally sets in in from three to six weeks. The second, or melancholic form, is the commonest. Dr. Kirn collected twenty-two cases. It seems a kind of exaggeration of the depression and disquiet of the ordinary convalescence from influenza. Sleeplessness is the first striking symptom, then discontent, with reproaches against the attendants and distrust and suspicion against the physician. The patient is hypochondriacal, or fears ruin, loss of money, or loss of honor, and occasionally there are attempts at suicide, frightful hallucinations, painful delusions, and refusal of food. The prognosis is good. Recovery, as a rule, takes place in six or eight weeks, though it is sometimes delayed for several months. He studied six cases of mania following influenza. They presented the symptoms of simple typical mania without hallucinations and without delusions. The delirium generally commenced about a week after the invasion of the influenza. Recovery generally supervened in from six to eight weeks.

All observers hold, with this writer, that the toxic matter of the influenza has an injurious effect upon the whole nervous system, and that it acts most powerfully upon those who already have a hereditary tendency to insanity. He found that 54 per cent. of those who became insane labored under this predisposition.

Dr. Schmitz, in a paper on Insanity After Influenza (*Zeitschrift*, xlvii. Band, 3 and 4 Heft), gives as his conclusion that influenza is mainly an epidemic nervous disease.

In the *Deutsche Medizinal Zeitung*, in the *Deutsche Medizinal Wochenschrift*, *Allgemeine Zeitschrift für Psychiatrie*, the Glasgow *Medical Journal*, and in other German, English, Russian, and in several French journals of recent date, appear articles of similar tenor. In the majority of cases recorded, where insanity followed the attack of influenza, it was of the melancholic or hypochondriac form, preceded by acute delirium, and, as might be expected, the preponderance of this psychosis was in previously neurotic subjects. Insanity may come on at any stage of the influenza, but it usually appears during the period of convalescence, while the nervous symptoms set in at the beginning of the disease, or at any time during its progress or convalescence. The most marked and persistent sequelæ are insomnia, neuralgias, neuritides, and neuratrophia and its symptoms, neurasthenia and cerebrasthenia.

Dr. Julius Althaus, in a recent paper in the London *Lancet*, November 14, an excellent epitomized analysis of which appears in the editorial pages of the *Boston Medical and Surgical Journal* for December 10, on the neurotic character of the grip, says: "It is always a true nervous fever, the symptoms of which only differ as far as localization of the grippe-toxine in different areas of the nervous system is concerned, and that all the symptoms of the feverish attack of influenza are referable to irritant poisoning of a definite centre of the nervous system. Shortly after the visitation of influenza had commenced, a number of patients complained of severe forms of neuralgia, loss of power, and a general break-up of the nervous system, which they attributed to an attack of grip. Some of these patients had been in perfect health before, while in others a neurotic pedigree or a previous syphilitic infection, or some other constitutional fault could be clearly traced, upon which the subsequent nervous affection had, as it were, been grafted. In comparing those nervous troubles which may be met with after such diseases as diphtheria, typhoid fever, scarlatina, small-pox, measles, erysipelas, and malaria with those seen after influenza, it soon became evident that as a powerful etiological factor of all kinds and forms of nerve disease influenza stands *facile princeps* among all infectious fevers. A clinical survey of the symptoms of the feverish attack, such as headache, utter prostration of mental and bodily strength, delirium, coma, convulsions, etc., points unmistakably to the nervous system as their starting point. In the London epidemic, the fact that catarrh of the mucous membranes and pneumonia have been completely absent in a large proportion of cases, indeed, many patients have had influenza badly without having once coughed or sneezed, shows it to be not so much an infectious catarrhal fever, as has been generally assumed, as an infectious nervous fever." But the sneezing and catarrh, when they are prominent, do not militate against the conclusion of nervous implication, but only further prove it.

Dr. Althaus also remarks on the power of la grippe to revive a dormant syphilis, and to bring into activity certain syphilitic diseases of the spinal cord.

The similarity of the symptoms in all cases, are suggestive of grip toxine, as Althaus calls the poison of the epidemic, the neural symptoms being somewhat modified by climate.

The epidemic reported by Medin, of Stockholm, before the Tenth International Congress (*vide* "Transactions," and *Centralblatt für Klinische Medicin*, September 5th, 1891), in which within five months, forty-four cases were observed in previously healthy children, was probably a form of the grippe. In the febrile stage there was generally fever, somnolence, dyspepsia, constipation, rarely vomiting and diarrhœa, and paralysis.

The fever and somnolence lasted in some cases several days after the onset of the paralysis, but further paralysis did not take place after the fever had disappeared. Facial monoplegia was noted in three cases, and facial paralysis with poliomyelitis and polyneuritis in another five. Abducens paralysis was present in five cases, twice together with ordinary poliomyelitis, once at the same time as polyneuritis, once in a case of polio-encephalitis, and once in a fatal case. All the nuclei in the pons and medulla corresponding morphologically and physiologically with the cells in the anterior horns of the spinal cord, were at times affected.

In the discussion, Heubner characterized it as an infectious disease, and Henoch also spoke upon the striking identity of the cases and the presence of so many cerebral symptoms.

In the discussion before the Medical Society of London following the papers of Drs. Althaus and Savage, on December 14th, Dr. Symes Thompson, after remarking on the fact occasionally noted that a pre-existing insanity had also sometimes disappeared after the supervention of an attack of grippe, just as any great shock, such as a fall from a second story window, might drive away a brain trouble, and recording a case of herpes following the course of the fifth nerve after an attack of influenza.

His father, the late Dr. Theophilus Thompson, had collected much historical evidence on the nervous side of this ailment. In the epidemic of 1836 and 1837, the indications of its connection with nervous disease became clear. Graves probably was the first to point out, though Blackiston divided the honors with him, that the pulmonary affections were due to the removal of the nerve control from the lung—to a serious morbid influence on the vagus nerve. Again in 1847, Dr. Peacock drew attention to the fact that lowered vitality of the nerve centers was one of the chief characteristics of influenza. They had evidently noticed the points which Dr. Althaus had emphasized. His father had assumed that there might be some connection between the spread of the disease and the distribution of low forms of animal life; the microbic theory not then prevailing as it does now.

Dr. Symes Thompson considered that the cases of extreme dyspnœa in the early stages of the disease, without manifest pulmonary signs, pointed to lesion of the vagus nerve. He had seen two fatal instances from exposure to cold during the second week of the illness. Those cases of tachycardia in which the

heart ran up to 200 or more per minute, and in which recumbency was so essential on account of tendency to cardiac failure, also pointed to nerve lesion, and Dr. Ord's recent paper on the cardiac conditions associated with gastric symptoms was worthy of thought in this connection. In influenza the gastric complications were of the nature of a crisis, and the attacks had something in common with sea-sickness, a desire to be left alone or to die being often expressed. Dr. Bezley Thorne held that the fever and the initial symptoms were matters of little importance, but that after the invasion was over the nervous system became occupied by a poison which might remain for weeks or years. One salient feature of this occupation of the nervous system by poison was a prolonged congestion of the vessels of the cerebro-spinal system. In early cases he had found that two-thirds of the females exhibited this spinal tenderness, while of the males one-third showed the same symptom; the disease, therefore, could not be limited in its incidence to the medulla oblongata. He had noticed radiating symptoms. If he percussed over the cervical vertebræ, pain was referred to the neck, and so on lower down the trunk. He held that every case should be treated as one of cerebro-spinal concussion, and kept in the recumbent position. He had known carriage exercise, prematurely indulged in, to produce neuritis, and he had observed loss of heart-power, or other symptoms of cerebro-spinal meningitis, to develop. Influenza was followed by a period of vital depression, which was one of great danger: the temperature might be markedly subnormal, and the condition of the patient so extremely weak, as to necessitate keeping them lying down.

Dr. Savage said it was remarkable how often of late he had noticed that melancholics with a rapid pulse had a previous history of influenza.

The nervous system of the eye in this disease has engaged the attention of Dr. John E. Weeks, who discusses la grippe, in the *New York Medical Journal* of August 8th, 1891, as a cause of retro-bulbar neuritis. The following are his conclusions:

1. Neuritis of the optic nerve due to la grippe is of relatively rare occurrence. It may affect one or both eyes, and may produce partial transient impairment of vision, partial permanent impairment of vision, or absolute permanent blindness. 2. Failure of vision begins from 3 to 14 days after the commencement of the attack of la grippe and proceeds quite rapidly. 3. The form of scotoma produced is probably dependent on the position of the neuritis in the course of the nerve from the globe to the chiasm. If immediately behind the globe, the muscular fibres are affected; if near the optic foramen, the peripheral fibres suffer first. 4. Treatment has little effect to promote cure. If recovery follows, it takes place spontaneously and accompanies improvement in the patient's general health. 5. The neuritis of motor nerve branches resembles those occurring after diphtheria and are mostly of transient character. They may occur in any or all of the nerve trunks pertaining to the eye.

The epidemic in St. Louis has been associated with a great deal of pneumonia, likewise in St. Paul, Kansas City, Louisville, and Cincinnati, a likely complication in these Mississippi, Missouri, and Ohio Valley cities where malaria adds its depressing influence on the central nervous system to that of the grippe toxine or microbe. In Cincinnati, the veteran and accomplished editor of the *Medical News*, Dr. J. A. Thacher, recently very suddenly died of pneumonia and vagus paralysis after a few days of this disease.

Dr. Helfer Jahrbuch reports a case of astasia-abasia resulting from the epidemic, and I am not certain that the influenza has not been the cause of a case now under observation in which I am undecided as to whether the apparent motor paresis is due to the cord or to neuritis.

The marked feature in my observation of this unique malady is the disposition it displays to bring out latent morbid predispositions.

Without a wearisome detail of cases, I may simply say that it has brought back to my office perhaps five per cent. of my dismissed cases of neurasthenia, neuralgia, and neuritis, a number of cases of previously recorded insomnia, and caused a relapse of some cases of syphilis of the nervous system; while the number of cases of malarial rheumatism and malarial neuralgia brought into activity in persons previously exempt, has been one of the remarkable facts of this singular epidemic.

I have known cases of syphilis to return in cerebral and neural form after many years of quiescence, under its quickening influence.

It does seem that this poison tends to so weaken the nutrition of the nerve centers that normal resistence to inherent, but abeyant, neurotrophic tendencies is destroyed, and subdued nerve instability breaks out anew in acute form.

In the discussion before the London Society already alluded to, Dr. Althaus referred to a case in which a man, after two attacks of influenza, became melancholic and hemiplegic, passing into a condition of general paralysis of the insane. Another patient of temperate habits, after an attack of influenza, developed a complete left hemianæsthesia. From this he recovered, but he has since died with all the signs of spastic spinal paralysis, which had developed much more rapidly than was the case in syphilis, and very justly concludes that while we had to deal in these cases with a large amount of local nerve disturbance, it was also combined with central nerve disturbance, and it is this central nervous disturbance which brings into re-awakened activity the quiescent morbid tendencies, a previously subdued neuropathic instability, or excites in previously healthy nerve centers a diseased action *de novo*.

From a consensus, therefore, of all experience, it is plain that the influenza belongs more especially than elsewhere, in its symptomatology, at least, to the domain of neuropathology, whatever may be its *materies morbi*, or microbe.

Following are briefly some of my cases:

A young man, aged 22, had the influenza last year, and again this year one month ago. Since the first attack he has been unfitted for business, has been debilitated and more sleepless than formerly. No pains, but simply general neurasthenia. Appears in good flesh.

A contractor, aged 51 years, was never sick or incapacitated for business before an attack of la grippe a few months ago. Since then, insomnia, vertigo, and a constant tired feeling with inability to fix his attention on business, and the return of an old intermittent, have compelled him to give up his business.

A traveling salesman, aged 52, two months after grippe, has persistent vertigo, insomnia, lumbar pains,

and constant aching in the dorsal spinal region, so that he seeks treatment and gives up his business.

A railway-car inspector living in East St. Louis, aged 54, after grippe two months ago, has an old ague return, with loss of appetite, jaundice, and hæmaturia, notwithstanding active anti-malarial treatment.

A railway employee, forty years of age, convalesces from it with chronic lumbago and sciatica.

A married lady, mother of two children, having recovered two years ago of vertigo and the morbid fears of neurotrophia, after an attack of the prevailing epidemic, has a return of all her former symptoms.

A middle-aged business man of large affairs, after an attack of the grippe, comes to me with vertigo, insomnia, pains in limbs, and glycosuria, the latter disappearing after several weeks of treatment.

The brother of the above, two years older, in very active business, three weeks after the grippe, has constant aching over dorsum and sacrum, loss of appetite, and nervous debility.

In my own person, after slight attack of grippe in Boston, in August two years ago, hay fever symptoms appeared and persisted for some weeks, followed later by sciatica and abdominal neuralgia—symptoms to which I had hitherto been an entire stranger through life; and my wife remarked to-day that she had not seen a well day since "that attack she had, whatever it was," two years ago. It was the grippe, a former neuritis returning and persisting.

My son, Ray, was suddenly attacked two years ago by the epidemic, and these were his symptoms: high fever, temperature, 104 Fah., intense head pain, pain in ears, delirium, constipation, insomnia, severe aching in back and limbs, thirst, highly colored and scanty urine, and dry skin.

These symptoms were actively treated with phenacetine and quinine the first day, bromide of sodium at night, one dose salicylate of sodium the second day, with quinine (five grains) and bromide of sodium at night. Later ten grain doses of salicylate of sodium were given every three hours (large doses for a child). All symptoms had disappeared by the third day, the fever left him after the first twelve hours, so that his brain was saved.

This outline of treatment is, in substance, the plan pursued in the acute attacks of all my cases, with the addition, sometimes, of special medication for complications and sequelæ.

A lady of fifty-two years of age, after two successful excisions of the mammary gland, twelve and thirty months ago, without apparent return, after an attack of grippe, developed diabetic melancholia four months ago with delusions of impending destruction by electricity, and loss of her bowels. The uterus and ovaries appear healthy, and the delusions and depressions have, for the time, disappeared under treatment and removal from home, a fact which contra-indicates the metastasis of the cancer to the brain. Neuropathic and psychopathic instability exists in her family, another fact which contra-indicates metastasis.

A lady after confinement and a seizure of the grippe, develops insomnia, extreme irritability and aversion to her husband, modified, but not subdued by codia, hypophosphites, chloral, and tonics, but not yet overcome ten weeks from the attack.

A merchant in Iowa, two months after the grippe is melancholic, sleepless, and gives up business. He improves by leaving home, and going under treatment, but is still anæmic and neurasthenic.

A patient who previously has had an eczema, has it return on him after an attack of influenza.

A patient who comes to me with cervical meningomyelitis, and associated neuritis, and convalesces with partial paralysis of the left arm, has a history of an obscure and painful febrile attack in which boils or carbuncles (differently described by the two physicians who attended him) appear over his neck and body. The grippe was prevailing extensively in both places at the time of his sudden illness, six months ago.

A child of six years after an attack of influenza, develops epilepsy. His father was an inebriate and nervous.

Of varying forms of bulbar paralysis recently under my care, several of them have been directly traced to the prevailing epidemic as the exciting or final cause, at least.

One of these was a physician, surgeon-in-chief of an important railroad system, in which this cause superadded to over mental work precipitated the paralysis, death resulting from pneumo-cardiac failure due to vagus paralysis after convalescence from the other bulbo-paralytic symptoms.

In another case, after about four months from the decline of the acute symptoms of the influenza, aphasia and glossopharyngeal paralytic symptoms set in, an old, long dormant syphilis being awakened into activity.

Another venereal patient who thought himself cured years ago, four months after the invasion of influenza, is now under treatment for hesitant speech, mental incapacity for his accustomed avocation, extreme nervous irritability, and general neurasthenia with enuresis, but no sugar or albumen in urine. Six months after the invasion, another case, after much improvement in the pharyngo-laryngeal and gastric enervation, shows persistent symptoms of general neurasthenia, with some neuritis.

Another patient shows hesitating speech, partial dementia, unequal pupils, one largely dilated, and paresis, with great self satisfaction, though incapacitated for business. Later partial epilepsia appears giving a suspicion of a revived neural syphilis.

Still another with a former history of venereal poisoning, had speech failure, insomnia, and unsteady gait, but is now convalescent under persistent specific treatment, quinine, phenacetine, and electricity.

In short, the tendency of this toxic inflammatory neurosis is to shatter the nervous system, central and peripheral. It is a severe strain on the inherent *vis medicatix* which normally resides in the nerve centres. It tears open old neural wounds that have once healed, and causes new ones to appear. It stirs up the neuropathic pool, which is no pool of Siloam to the unfortunate victim. A Pandora's box of neuropathic woes seems to open after its advent, and not to close with its departure. And while Althaus has called attention to the resemblance of grippe in its behavior to that of syphilis of the nervous system, many other observers, like Dr. Weeks, have likened its neuropathic sequences to the sequelæ of diphtheria as regards their amenability to treatment and tendency to ultimate recovery under proper treatment. This is my own view and experience also. It seems to be rather ad-neural than intra-neural in its effects upon the central nervous system, the bacillus of Teissier and others (if it be due to a microbe) producing an adventitious rather than intra-neural effect

which seems capable, in most cases, of removal; such, at least, has been the practical experience of others as well as myself, judging from the yielding of the neuritides generally, and often of the paralyses to treatment.

In conclusion, the lesson I think I have learned from personal observation of this epidemic in its effects upon my own patients is: That it is, in its incipiency, as well as its sequences, a toxic neurosis; more largely ad-neural than intra-neural (though the fatal ending of Althaus' cases of paralysis would point to intra-neural lesion, also); that the neuropathic lesions, central or peripheral, are rather more prone to recovery than other similar and apparently as grave nervous lesions occurring before the epidemic appeared; that its neuropathic sequences act more like the post-diphtheritic nervous diseases in regard to curability; and that it brings to the surface and into vicious activity latent neuropathic and other organic morbific aptitudes.

The *rationale* of its successful treatment consists in anticipating and combating whatever disease the patient may be prone to: gouty, rheumatic, malarial, or venereal.

The best medicines in its treatment in my hands have been phenacetine, quinine, the salicylates, iodides, and bromides, according to the prominence of symptoms. Generally phenacetine and quinine in the beginning for two days, with bromide of sodium at night, drachm doses; after the second day, the salicylates and iodides, continuing bromides at night so long as there is restlessness or insomnia, and the phenacetine so long as temperature may be exalted, and also always an initial mercurial cathartic or laxative.

This therapeutic outline being modified according to the *rationale* of recurring or continuing indications.

ACUTE RHEUMATIC NEURITIS.

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The following cases may be of interest.

About eight years ago I was called to see a patient, male, aged 30 years. He complained of intense pain at the tip of the left shoulder. On close examination I found that the seat of pain did not cover an area larger than a silver half-dollar at the end of the acromial nerve. Accompanying this pain there was quite a high temperature—103°F. Pressure through the shoulder-joint did not elicit pain; no pain elsewhere. I prescribed morphia and aconite. The former in sufficient doses to relieve the pain. While under the influence of the anodyne the pain was mitigated, but as soon as its influence passed off the pain returned in its previous severity. The aconite did not reduce the temperature. Quinine was administered but it did not reduce the temperature or relieve the pain. This line of treatment was carried out for several days without improvement in my patient; the morphia being the only remedy of any service, and it controlling but the one symptom of pain. The case did not appear to be one of ordinary neuralgia owing to the elevated temperature and abrupt onset. Neuritis suggested itself, but the clinical history and other features excluded this diagnosis. Thinking the case might be one of rheumatic character I prescribed large doses of salicylate of soda. The result was prompt and brilliant. The pyrexia disappeared and the pain vanished.

During the past winter a gentleman, 58 years of age, sent word one evening that he was suffering with a pain in his left shoulder and desired me to send him a prescription. The prescription sent called for a liniment composed of tinct. opii, tinct. belladon., and linimentum ammon. The next morning a message was left to call and see the patient, as he was no better. On making my visit I found that he had passed a restless night, and movement of the shoulder caused an exacerbation of the pain. With some difficulty the clothing was removed in order that a thorough examination might be made. In this case I found the symptoms identical with those of the above case, with the exception that the temperature was not so high. Salicylate of soda afforded prompt relief and soon cure.

Intervening between these cases I saw two other similar ones, but as they are not sufficiently distinct in my memory I am unable to particularize.

On Tuesday, April 14, 1891, I was called to see Albert M., aged 12 years, and received the following history, viz: On the previous day he was seized with pain in the left leg; this pain became so severe that he was unable to move the limb, which was kept slightly flexed, and when this position became irksome, to change it required the assistance of his mother, and was accomplished with much pain. The mother thought these pains were only "growing pains" and applied some liniment. On the morning of the day of my first visit the pains left the left leg and abruptly attacked the right one. He could now move the limb first effected without pain, some stiffness only remaining. Before examining the right limb and while getting the above history, I took the temperature and found it to be 101.5°F. When the bed clothing was removed the patient shrank from dread of my touching the leg. After assuring him I succeeded in ascertaining that the tenderness was along the entire length of the sciatic nerve as well as along the anterior crural. There was also some tenderness along the lower portion of the spine. None of the joints were involved. Recognizing this case as being similar to the cases narrated I, however, did not place him upon the salicylate but resorted to experimentation in order to exclude spinal congestion and acute neuritis, diseases that suggested themselves, although there were no disturbances of motility and sensibility, only so far as pain was concerned. The nerve symptoms were also too acute for such diagnoses. I put him upon ergot, aconite and bromide of potash, with counter-irritation to the spine. The next day there was no improvement, and he had passed a sleepless night. My previous prescriptions were continued and supplemented with one containing chloral. Hot applications were also to be applied along the painful nerves. When my third visit was made, I found that the chloral had produced some sleep, otherwise there was no improvement. At this visit all of the remedies were withdrawn excepting the chloral, and as the bowels were not moved a cathartic was ordered. On making my fourth visit things were *in statu quo*. I now placed him upon salicylate of soda alone, ten grains every three hours. On making my fifth visit, as I entered the room the patient greeted me with a smile and said he felt well. He could now move both legs, the right only a little

stiff, and I could resort to deep pressure over the effected nerves with the result of only causing a feeling of soreness. The patient was out riding in three days.

Headache was not a marked symptom in any of these cases.

In looking over text-books and consulting various authorities, I fail to find a description under any heading covering the cases here presented. The disease is not a new one, for my cases presented themselves at different times within a long period of time—it simply passed without recognition and description. Even that acute, accurate and pains-taking observer, the late Austin Flint, makes no mention, in his article on acute rheumatism, of this type of rheumatism which I have designated as acute rheumatic neuritis. The points of analogy between this disease and rheumatic fever are: 1. The rather sudden onset. 2. The elevated temperature. 3. The severe pain. 4. The leaving of one nerve abruptly, and flying to another, and 5. The rapid improvement under large doses of salicylate of soda.

Pittsburg, May 15, 1891.

THE DISEASE OF INEBRIETY IN ITS RELATION TO DISEASES OF THE MIND AND NERVOUS SYSTEM.

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Dipsomania is a form of physical disease, and it consists of an uncontrollable and intermittant impulse to take alcoholic stimulants, or any other stimulant or narcotic which causes intoxication. We must distinguish between this disease of the nervous system, which is one form of periodical insanity, and the physiological state in which the individual merely chances to indulge in liquor to excess. The great question of importance is to distinguish the two states or conditions when the result—intemperance—is the same. We must observe whether there are symptoms in our patient which can be referred to primary disease of the nervous system. We must examine for hereditary influences, which, when present, lead us, of course, to suspect disease. Early development of the appetite for stimulants points in the same direction; but the great diagnostic mark attending the *disease* is the irresistible impulse or craving, by which the patient is impelled to gratify his morbid propensity, being, during the paroxysm, blind to all the higher emotions, and pursuing a course against which reason and conscience alike rebel. There is a compulsion of disease toward intoxication which cannot be resisted. These paroxysms are preceded by considerable disturbance of the nervous system. The patient perspires and is sleepless, uneasy, and prostrated, and so craves some stimulant.

Between the paroxysms he is different from a common drunkard, in oftentimes disliking exceedingly all stimulants, and is then a useful member of society. The patients with whom the medical profession will come in contact as sufferers from this disorder of the nervous system, are not from the lower classes, as many suppose, but come chiefly from the brain-working and cultured classes, and embrace lawyers, physicians, clergymen, and merchants. Dipsomania has been described under three forms: acute, periodic, and chronic. The acute form is the rarest, occurring only after exhausting diseases or excessive sexual indulgence. The periodic form is by far the most frequent, and is observed in persons who have suffered injury to the head or spine, females during pregnancy, and at the catamenial period, and also in men whose brains are overworked.

This form is frequently hereditary, and, consequently, proportionately difficult of cure. These patients may abstain for weeks and months from all stimulants, and may, during this interval, positively dislike them. At last, however, the patient becomes uneasy, listless, and depressed; is not inclined to apply his mind, and finally begins to drink and continues until intoxicated. It is an interesting and rather remarkable fact that with this class of cases, as Charles Lamb, in his *Confessions of a Drunkard*, pertinently remarks: "To stop short of that measure which is sufficient to draw on torpor and sleep, the benumbing, apoplectic sleep of the drunkard, is to have taken none at all. The pain of the self-denial is all one."

The patient continues this course for ten days, or perhaps a fortnight, and then bitterly regrets his fall. This often runs on, if not checked, into mania, and lapses into dementia. The last, and a very common form also, is the chronic form; and we have always found this to be the most incurable form of the disease, as the patients are incessantly under the irresistible desire for alcoholic stimulants. I think the latter class of cases require constant seclusion in an asylum if they wish to be free from intoxication, as a discharge or leave of absence is always followed by a repetition of the same acts. In a majority of cases of this nature, we find hallucinations of sight and hearing, which oftentimes produce very painful moral impressions, and at times even great terror in the patient. Cases of delirium tremens are excluded in these remarks.

These patients manifest confusion of thought, perversion of feeling, suicidal tendencies, tremors of the facial muscles and tongue, anæsthesia of the extremities at times, and very often paralytic symptoms, going on to general paralysis. The subject of hereditary metamorphosis of the diseases of the nervous system is of great importance in this connection. As a result of intemperance in the progenitors, we find transmitted to the offspring allied but different forms of the neuroses. It may be dipsomania, epilepsy, chorea, or actual insanity, or a proclivity to crime. It is, at all events, an aptitude for some form or other of nervous disorder, the particular form being often determined by causes subsequent to birth. The law of hereditary transmission applies equally to the victims of dipsomania as well as to the other insane classes, and is to be studied, I think, in three divisions, according as it is manifested. First, in predisposition or simple aptitude, the result of a defective organization, and a weakened or diseased nervous system, as a result of which the possessor is predisposed, or has a tendency to seek for the relief obtained temporarily by alcoholic stimulants, when laboring under physical or mental depression; second, in the latent state or germ of this disease; and

third, in the actually developed disease. The first of these states, the predisposition or aptitude, being hereditary in a strong degree, is universally acknowledged to be the most difficult to eradicate, and requires the wisest sanitary conditions adapted to both body and mind. Most people doubt the existence of the second or latent state or germ of the disease, ignoring the law of progressive development, and such persons find it difficult to believe that dipsomania coming on in maturity, as a result of ill-health, mental shock, etc., may have originated in intemperance in the parent or grandparent. Yet this is a fact, and is just as easy of comprehension as the fact well known to neurologists, that brain-tissue degenerations and mental diseases may be separated by long intervals of time from the too premature and intense stimulation of the brain in the young, which causes these nervous diseases. One very important organic law which should be universally understood in this connection, is, that morbid impulses and characteristics and traits may disappear in the second generation and break out with renewed intensity in the third, although a tendency or predisposition may be transmitted to the offspring, and under good hygienic and other favorable circumstances die out and fail to be transmitted any further. I have remarked in my experience with the insane, whether the exciting cause be intemperance or something else, that the cases most unlikely to recover are those where the insane temperament or diathesis is clearly marked, and where the predisposition to disease is inherited. Such patients, although they may have lucid intervals, rarely, if ever, entirely recover.

I think the insane impulses to drink, which overcome all the efforts of the individual who inherits a tendency in this direction, present the same indications for treatment as do the suicidal and homicidal impulses, namely, seclusion from society, and the occasion of temptation, and the necessary restraint in a suitable institution. I do not agree with that class of persons who hold that, under all circumstances, the dipsomaniac is to be treated as an invalid, with the utmost gentleness and forbearance, and then, with the strangest perversity, turn round and tell you that inebriety is no excuse for criminal action, and fine and imprison, perhaps, the unhappy man who has been driven into the debauch by an irresistible craving for drink, when properly he should be treated as insane, and should be sent to an inebriate hospital for restraint, treatment, and cure. There are some people who appear to think it no disgrace for the head of the family to leave his home and business and insanely hide himself away in the slums of the city to drink until intoxicated, and continue this course for several days, and repeat this every three or six months until health, business, and family ties are ruined; but who would foolishly look upon it as a great disgrace to send him away from home for the proper medical care and attention and restraint necessary for his restoration. It should be the province of every conscientious family physician to educate those families committed to his charge respecting their duties in such cases, and to instruct them that *inebriety is a disease curable as other diseases are, if the patient will but submit himself to the proper restraint for a sufficient length of time to be cured.* Our laws at present fail lamentably in preventing intemperance, and this is due in a great measure to the false view in which this disease is held by the judiciary. The different forms of dipsomania correspond in their manifestations, and oftentimes in their causes to other cases of mental disease, and cannot properly, I think, be separated from them as regards the fact of the disease.

Dipsomania often appears as a result of the same causes that operate in the production of other types of mental disease, such as ill-health, severe mental shock, blows on the head and spine, and sunstroke. We are dealing in both cases with abnormal cerebration; in the one case associated with mania, melancholia, dementia, and idiocy; and in the other with a depraved alcoholic appetite—an irresistible impulse which the mind seems powerless to control; an insane impulse, just as surely as a homicidal or a suicidal impulse is an insane impulse. I think that when our cerebral pathology, which is as yet in its infancy, becomes more generally understood, it will be found equally applicable to this as to other forms of insanity. The terrible insane craving for alcoholic stimulants is often the result of a lowered vitality or abnormal organic development of the nervous system that has descended from generation to generation, gaining in intensity until it manifests itself by the complete loss of self-control and active inebriety in children and grandchildren, after they once taste intoxicating liquors and indulge in them.

The blunted moral perception which so many inebriates exhibit, and which renders them peculiarly liable to a relapse after they leave an asylum, is to be regarded in the same light, I think, as the perverted moral sense in moral insanity. In every institution for the insane we find inmates who exhibit no obvious intellectual aberration or impairment, the *moral* faculties being deranged, while the *intellectual* faculties remain apparently in their normal condition. The manifestations of moral insanity may be a simple perversion of some sentiment or propensity under certain exciting causes; and I think this exactly comprehends cases of dipsomania with loss of self-control and perversion of the moral sense. The person, of course, is aware that the act is wrong in both instances, but the control which the intellect exercises over the moral senses is overborne by the superior force derived from the disease. I have been told many times, by both insane patients and dipsomaniacs, that the feeling on the one hand to commit some insane deed, and on the other to give way to alcoholic appetite, was contemplated in both instances with horror and disgust, and at first successfully resisted, until at last, having steadily increased in strength, it bore down all opposition. What can be a more powerful argument in favor of the disease theory of dipsomania?

Pathology of Dipsomania.—The basis of our cerebral pathology is the fundamental principle that healthy mental function is dependent upon the proper nutrition, stimulation, and repose of the brain; and upon the processes of waste and reparation being regularly and properly maintained. We know that the cerebral cells are nourished by the proper and due supply of nutritive plasma from the blood, and that this is essential to healthy function; and, indeed, the ultimate condition of mind with which we are now acquainted, consists in the due nutrition, growth, and renovation of brain-cells. If, now, we take into the system an amount of alcohol that causes the blood plasma to convey to the brain-cells a noxious and poisonous in place of a nutritive substance, stimu-

lating the cells so as to hasten the progress of decay and waste beyond the power of reparation, and impressing a pathological state on them, we must inevitably have resulting a change of healthy function and a certain amount of disease induced.[1] Owing to the abuse of alcohol we have resulting a change in the chemical composition of the cerebral cells from the standard of health, which is the foundation of organic disease, as it prevents and interrupts healthy function. As a result of the overfilling of the cerebral vessels or hyperæmia of the brain from the long-continued use of alcohol, we have at first symptoms of irritation, due to increased excitability of the nerve-filaments and ganglion-cells of the brain. The symptoms of exhaustion and depression occurring at a later stage are due to lost excitability of the nerve-filaments and ganglion-cells of the brain, owing to a want of a proper supply of arterial oxygenated blood to them. This is caused by the excessive cerebral hyperæmia, the escape of venous blood from the brain being obstructed; the result being that no new arterial blood can enter the capillaries. We may have apoplectiform or epileptiform attacks, and paralysis occurring in the course of these cerebral hyperæmias, and they may be due either to obstructed escape of venous blood or to secondary œdema of the brain, in which transudation of serum takes place into the perivascular spaces and interstitial tissue of the brain with consequent anæmia. Until very lately we have known little respecting the pathology of the nervous system, and consequently comparatively little information has been gained regarding the morbid changes that take place in the brain and its appendages as a result of the abuse of alcohol. Such knowledge in this direction as we do possess, shows that analogous changes take place in chronic alcoholism and chronic insanity—namely, atrophy and induration of the brain, and thickening and infiltration of the membranes. The nerve-cells have also been found to be the seat of granular degeneration in some instances, and some histologists have claimed to have discovered fatty degeneration of the various brain elements. Respecting the latter changes, Dr. J. Batty Tuke, of Edinburgh, who is one of the most successful of modern investigators in the department of morbid cerebral histology, gives it as his opinion that the application of the various tests for oil will fail to detect the presence of the so-called "free oil-globules" in the substance of the convolutions, which he considers to be but the scattered débris of granular cells. We find thickening and increase of the pia mater and arachnoid, and permanent infiltration of the former and a varicose condition of its vessels, as a result of continued abuse of alcohol. As the state of the pia mater is unquestionably closely related to the higher functions of the brain, the latter must suffer more or less as the result of such an abnormal condition of the former. If there exists a permanently congested and thickened state of the pia mater, it is extremely probable that if it becomes suddenly turgid and hyperæmic as a result of severe emotional disturbances, we shall have, resulting from the increased pressure on the brain, coma, epileptiform and apoplectiform attacks and other grave nervous symptoms. It is fair to conclude that in the majority of cases the first changes that occur are repeated attacks of active cerebral congestion, followed by chronic cerebral congestion and chronic cerebral meningitis; and that, as the disease assumes a chronic form, the brain takes on a secondary change and becomes anæmic, atrophied, and indurated—a state allied to cirrhosis. In these cases of chronic meningitis proceeding to atrophy and induration—of which I have seen quite a number—the prominent symptoms have been impairment of memory, dullness of intellect bordering on dementia, trembling of the limbs, tottering gait, hesitating slurring speech, and other symptoms indicative of gradually progressing paralysis.

In making autopsies, where the cause of death has been owing directly or indirectly to the abuse of alcohol, I have found cirrhosis of the liver, fatty and waxy liver, cancer of the liver, chronic Bright's disease, cancer of the stomach, and cancer of the bladder, and, in one case, a gummy tumor of the dura mater.[2] It is doubtless true that in many cases we shall find upon examination no pathological changes in the brain that are demonstrable by existing knowledge and appliances; but I think we should rather doubt the quality of our resources of observation than doubt the existence of pathological changes in this most delicate, sensitive, and complex of all organs when we have observed during life its functions to be obviously perverted, if not destroyed. Having endeavored to prove that dipsomania is a physical disease—that it is, in fact, a distinct type of insanity. I pass in conclusion to the consideration of the care of dipsomaniacs. Dipsomania, which I class as a periodic insanity, is more troublesome to manage than simple insanity, and requires, I think, a more perfect discipline, both moral and physical, than the latter.

In the treatment of inebriates we have primarily to build up and restore shattered constitutions and broken-down nervous systems. We have a class of patients to deal with whose digestive powers are weakened, whose appetite is impaired, whose muscular system is enfeebled, and whose generative function is often decayed; the blood is impoverished and the general nutrition is disordered. They are indirectly predisposed to the acquisition of nearly all

[1] It would seem most probable that the disease of inebriety arises from disorder in the sensory zone of the brain. We have in this disease an unnatural diseased appetite or taste. Molecular changes, or a sub-inflammatory irritation of the tempero-sphenoidal lobe in its lower parts (the differentiated centre for smell and taste) would naturally produce abnormal sensations of taste and prevert it, inducing that periodic insanity—dipsomania—with its train of unnatural, inordinate cravings; the indication of perversion of normal nerve-function. The *disease of inebriety*, and the alcoholic diathesis, depends, I believe, and is the result of, *some morbid irritation of the cortical sensory centres*. I think we have good reason for believing this, and its acceptance by the profession, as a disease of certain parts of the brain (a thing no more difficult of belief than that insanity, with sensory hallucination, is the result of a similar lesion), probably dependent upon special molecular changes, perverting brain-function, a condition markedly hereditary, as are most abnormal conditions of the centric nervous system, and evinced outwardly by great nervous irritability or restlessness, unnatural sensations, an uncontrollable desire for alcoholic stimulants, and a disposition to frequent fits of intoxication (the more prominent symptoms of this neurosis) would do much to render a hitherto vexed question conclusive and scientific.

The pathological evidence in favor of the fact that a departure from a healthy structure of the nervous apparatus exists—as in mental disorders—in dipsomania, was at first slender, has been yearly increasing, and is to-day unanswerable and conclusive. I also claim that, with the important and essential aid of private hospitals, we can successfully antagonize the force of this disease and cure it, by restoring to its normal condition the molecular nerve structure as in case of insanity. The treatment of this disease, therefore, is worthy of the highest consideration of the entire profession. I have treated many very brilliant professional and business men (for it is the finely organized brain and not the coarsely developed one that is affected by this disease) in my sanitarium, and by isolation, complete mental rest, the removal of all care and responsibility, a complete control on my part of my patient's habits and surroundings, and the use of quinia, strychnia, zinc, and electricity, I have sent these men, and not a few women, back to their places in society and business permanently cured, so that they have achieved honor and success. The term "drunkard" is worthy alone of the dense ignorance of fifty years ago respecting this disease. It is a misnomer. These persons are suffering from a type of mental disease. They want to be cured, and they *can* be cured, and it is the fault of the physician if they are not.

[2] This I consider as due to syphilis.

diseases, as they have, by long indulgence in alcohol, lessened the power of resisting their causes. We have to deal with the results of a toxic poison, which has resulted in more or less pathological change in the brain and nervous centres. We have also to deal at times with various complications proceeding from the abuse of alcohol, such as cirrhosis of the liver, gastritis, epilepsy, various forms of dyspepsia, and, in some cases, with Bright's disease. We must place our patient under the most favorable hygienic influences, provide for him cheerful, tranquil, and pleasant surroundings, repress cerebral excitement, procure sleep for him, and an abundance of fresh air and exercise. A permanent recovery depends largely upon allowing sufficient time for restoration of nerve-power, mental tone, and physical vigor, and complete recuperation of the will-power. After a few months of systematic care, judicious restraint, and enforced abstinence from the occasion of temptation until the will-power has been restored, my patients have generally recovered and have been restored to society, and I have had a very gratifying degree of success in my treatment of dipsomania. We must stimulate inertia, resist every kind of perverted feeling, and check morbid impulses; and at last we may, if we exercise a wise care and discrimination, restore our patients to their homes and to society, permanently cured. In building up the system after the wonted stimulus has been withdrawn, which is invariably from the first, and in combating the nerve-exhausting tendencies which are always present in a marked degree in such cases, in addition to nerve sedatives and tonics, we have had surprising results from the use of electricity to the brain and spinal cord, and by its use we avoid the terrible nervous prostration, which, as it is well known, follows the withdrawal of liquor from an inebriate. Our patients who have applied in fear and trembling, dreading the ordeal they must pass through in the beginning of treatment by reason of such withdrawal, have been as much surprised as pleased to find the use of electricity supplied to the nervous system an agreeable and invigorating substitute for the stimulus which they were debarred from using, in such a marked degree that little or no suffering was experienced. As I have found that strychnia was a physiological antagonist to alcohol, I have used it largely and successfully in the treatment of dipsomania. I give from $\frac{1}{60}$ to $\frac{1}{30}$ of agrain, thrice daily, in combination with quinia and tincture gentian comp., so that my patient takes one or two grains of quinine before each meal with the strychnia. This makes a pleasant bitter tonic, and one under which patients recuperate quickly.

The Causes of Premature Mental Decay and Nervous Exhaustion, induced by Dipsomania, and their Treatment.—Dipsomania as a disease will never, in common with other insanities, die out until the Anglo-Saxon race succeeds in producing, what it does not now produce, a physique and brain capable of meeting successfully the demands that our climate and civilization make upon it. To do this requires a bringing up of the physical tone of the American women, so that the conformation shall be what it should be for the best propagation of the species, and that she shall have what she has not to-day, the ability to furnish a suitable supply of wholesome nutriment for her offspring, as is the case with German, English, Scotch and Irish women. To-day the vital temperament is too predominant and too active, so much so as to require an undue proportion of the nourishment of the body. Nothing is more certain than that the physical development of most of our American women differs very materially from the physiological standard upon which the true law of increase is based. The remedy for all this lies in the hands of the general family practitioners, and it is to the subjects of diet, fresh air, sleep and tranquility of life of the young of the present generation, and to the general training of the young in educational institutions, that we must look for the production of a better type of physical and mental stamina. Parents should be taught that for their growing girls in high schools *more than two hours' study out of school* generally means weakened eyesight, headache, loss of physical vigor, loss of sleep and appetite, and disorders of menstruation. I think that the influence of physical culture, especially applied to women, and its influence on the body cannot be overrated, and that by due attention to this we shall see our young women graduating with health, good muscular development, and an abundance of vitality stored up for the trying duties of maternity, and with the greatest possible harmony of action between the physical and mental organization, tending to good health, and healthy progeny.

Physiology points to the necessity among our American women of a better developed physical system, more evenly balanced in all its parts or organs, for a greater harmony in the performance of all their functions, especially in reference to what may not be termed the primary laws of nature, so that their children may not be weighed down in the struggle of life with a defective organization, but be blest in the inheritance of a perfect anatomical and physiological structure in all its parts and organs, with a resulting harmony in the performance of all their functions, with perfect mental and physical health and immunity from the host of nervous diseases that affect so large a proportion of our people. It may seem as if an undue amount of attention is spent in the consideration of this question, but having, by reason of my specialty, devoted much time to the study and investigation of hereditary disease, I am firmly impressed that in order to eradicate dipsomania and allied nervous diseases, and to check the increasing tendency to physical degeneracy among American people, we must aim at the extirpation of radical defects in physical organization. At present the average number of children to each American family is steadily decreasing with each generation, and the children that are born exhibit a want of vitality, a want of stamina in the constitution, and such a predominant tendency to physical degeneracy as threatens seriously, it seems to me, the perpetuity of our native stock.

The pathology of the production of dipsomania, as well as most other nervous diseases, consists, primarily, in an interference with the proper nutrition of the cerebral tissues of the fœtus, so that even during embryonic life, the brain undergoes pathological changes, which induce deficient moral power, mental weakness and a predisposition to the acquisition of all forms of nervous disease, there being an ill balanced and defective state of the whole central nervous system. These diseases would cease to exist if a true, healthy civilization prevailed; but inebriety, in common with other nervous diseases, owes its origin to an artificial type, from wrong habits, pernicious customs and fashions, and from an unnatural culture and refinement where the laws of health and

life are altogether too much violated. These diseases have not been the growth of one generation, but of many, and by the laws of inheritance have become greatly increased and the effects intensified. To eradicate these evils and to perpetuate the race as it should be, there must be sound and healthy stock, and not organizations impregnated from their very origin with the seeds of disease and premature decay.

We find in dipsomania the general symptoms of exhausted nervous power, viz.: general debility of the body, inability to walk even short distances without fatigue, general feeling of languor, unwillingness to make any active exertion, great tendency to sweat, more especially at night, but also induced during the day by the slightest exertion, and often an unsteady gait. I have found these patients exceedingly prone to neuralgia. The explanation of this is probably due to the fact that there exists in such cases a warm, irritable, hypersensitive condition of the sensory nerve-cells of the central sensory tract, which is the sole seat of true nervous sensibility. The central nervous system is affected, beyond all doubt, by excessive drinking, and the degeneration thus produced, I regard as a powerful predisposer of neuralgia of the inveterate type. Aside from the direct influence impressed on the nerve-centres, I think that this irritable and hypersensitive condition of the central sensory tract is often induced by visceral irritative disease of the stomach, kidneys or liver, so frequently existing in inebriates, which almost necessarily affects the sensory nerves which ramify in these organs, and from these diseased nerves a more or less steady stream of irritative and wearing nervous impressions is transmitted, practically without cessation, to certain parts of the sensory tract, to which the sensory nerves from any given part may go, and as a result, sooner or later the central sensory nerve-cells are brought into that degree of nutritional disturbance which is the fundamental factor in neuralgia. The real seat of these severe neuralgias, from which so many dipsomaniacs suffer, is rarely, if ever, in the peripheral nerves of the affected region, but in the central nervous apparatus.

The heart's action is weak, often irregular, accompanied by palpitation, and not unfrequently with symptoms of indigestion. A change has also come over the man's mind, so that the very *morale* is changed. At one moment he may be very joyous and excitable, and then he will become greatly depressed. He will be very friendly and anon very hostile. He will be so obstinate that nothing can overcome his determination, and at other times you may lead him like a child. The heretofore ever ready and resolute man manifests marked indecision of character, and in other cases there may be an utter inability to fix the mind on any one subject, or to follow up a train of thought consecutively. Any force to cause permanent intellectual activity must be a mental and not a physical one. If the force be alcohol, which it often is, as it is becoming more and more the habit to resort to it for its temporary effects in this direction, the rate of interest paid for its use is frightful. Not alone is there a loss of tone in character and blunting of moral perception, but intellectual discrimination is much impaired, and impairment of all the mental faculties is almost inevitable. The ideas are more spontaneous, less under the power of control, and any exertion requiring continuous mental effort soon becomes impossible. There can be no doubt that alteration of the brain is taking place *parri passu* with these alterations of character. It may be atrophy, or the circulation through the encephalon may be checked or impeded by ossification or softening of the cerebral arteries, or some disease of the heart itself, or the neurine may be undergoing a change, particularly on its peripheral surface, as well as on the surface of its ventricles or cavities. The convolutions become paler and the furrows shallower. The weight of the whole cerebrum and cerebellum is lighter and less complex. Softening of a very delicate nature, so delicate as only to be detected post-mortem, by letting a little stream of water flow gently over the surface of the brain, may be taking place, or what is very likely, and is often passed by unnoticed, because discernable only to a well-practiced eye, which may not be present at the right moment for observing its attack, is a very slight fit of apoplexy and paralysis, so slight indeed, that it occurs and passes away unnoticed and unperceived, and is recognized only in its after consequences and permanent effects. From such an occurrence, though loss of life does not ensue immediately, yet in its ultimate effects it is sooner or later fatal.

The patient is an altered man and never recovers himself. So delicate is the tracery of the nervous structure, that the damage of a single fibre or set of fibres destroys the unity of the whole. There are generally three things present that lead to these attacks of cerebral hæmorrhage, and as these attacks play a very important part in the production of premature mental decay in inebriates, it is desirable to thoroughly understand them and estimate their importance. The three things alluded to are hypertrophy of the left ventricle of the heart, chronic disease of the kidneys, and finally, degenerated cerebral arteries. The hypertrophy of the heart is a simple hypertrophy of the left ventricle, the wall of the ventricle being thickened without any dilatation, although in exceptional instances dilatation may ensue. The blood in inebriety is more or less noxious to the tissues, since it contains alcohol, and its passage into the capillaries is undoubtedly resisted by contraction of the small arteries, the vessels most rich in muscular tissue. The muscular coat of these vessels, therefore, is hypertrophied in antagonism to the heart. Since the small arteries are hypertrophied throughout the body, the obstructions, though each is slight, are in their sum total so large, that in order that the circulation may be carried on efficiently, hypertrophy of the heart must ensue.

There may be, doubtless, degenerative changes in the small arteries, so that there is increased bulk with altered structure. It should not be assumed, I think, as it often is, that all the processes leading to cerebral hæmorrhage and apoplexy are of a degenerative origin, as there can be no reasonable doubt that the presence of alcohol sets up a condition of sub-inflammatory irritation, which plays a very important part in the production of cerebral hæmorrhage. The sub-inflammatory irritation causes the arteries to lose much of their elasticity and to become permanently wider, longer and more tortuous. This absence of elasticity of the larger arteries becomes, by the withdrawal of the aid to the circulation in equalizing the flow of the blood, an important factor in leading to rupture of the smaller arteries. When the brain wastes slowly, as it often does, the dilatation of the vessels, and the increase in the quantity of the cere-

bro-spinal fluid, favors rupture very decidedly. There can be no doubt that the occurrence of cerebral hæmorrhage in inebriates, resulting from abnormal strains, would be much more frequent, were it not for the provision which nature has made for the protection of the brain from suddenly increased afflux. The turns of the carotid and vertebral arteries, the free anastomosis of the circle of Willis, and the small size of the arteries beyond that circle, before they enter the brain substance, all tend to protect the brain. The perivascular canals also exercise a protective influence over the vessels they surround, and in the corpus striatum, where cerebral hæmorrhage is especially liable to occur, as its vessels are not capillary in size, and proceed from the middle cerebral artery, which is almost the continuation of the internal carotid, we find the perivascular sheaths of very large size. When I say, then, that I consider one of the principal causes, if not *the* principal cause, of premature decay occurring in inebriates, to be the occurrence of cerebral hæmorrhage, or apoplexy resulting from the degeneration caused by the poisonous effects of alcohol upon the tissues, I do not think I overstate the actual facts. We generally have associated in such cases hypertrophy of the left ventricle of the heart, as I have previously remarked, chronic disease of the kidneys and degenerated arteries. The strong left ventricle and inelastic arteries combine to prevent the wave of blood sent to the arteries from being properly equalized, and consequently the smaller arteries of the brain, which are normally thinner than the arteries of other parts, and which are degenerated, receive the impulse from the heart's action, and being thus diseased and fragile—perhaps dilated and aneurismal—give way.

Before passing to the question of treatment, I desire to briefly notice an interesting question, and one to which very little attention has as yet been directed. The question is that relating to *the degree of moral or criminal responsibility which attaches to inebriates.* Inebriety depends very frequently, as we all know, upon an abnormal organic development of the nervous system that has descended from generation to generation, gaining in intensity all the time. There must certainly be a modified responsibility when homicidal or suicidal acts are committed during periods of such abnormal cerebration. In such cases, a criminal act may be committed in consequence of cerebro-mental disease, without any apparent lesion of the perceptive or reasoning powers. In these cases, also, the mental disorder is of a sudden and transitory character, not preceded by any symptoms calculated to excite suspicion of insanity. It is a transitory mania, a sudden paroxysm, probably epileptiform in nature, in which convulsive activity is not reached except so far as the mind is concerned, without antecedent manifestations, the duration of the morbid state being short, and the cessation sudden. In these cases the criminal acts are generally monstrous, unpremeditated, motiveless, and entirely out of keeping with the previous character and habit of thought of the individual. Such attacks are short in proportion to their violence. There is an instantaneous abeyance of reason and judgment, during which period the person is actuated by mad and ungovernable impulses. I would by no means wish to be understood as advancing the plea that inebriety, as a simple habit, should exempt or protect a man from the consequences of criminal acts committed while under its influence; but if he has unhappily inherited an abnormal organic development of the nervous system, so that mental delusion, weakness or disease deprived him of the power of choice, and if we can say, but for the presence of these morbid conditions, the habit never would have been formed, we should then look upon his inebriety as due to mental disease, and hold him responsible accordingly. In dipsomania we have a true, uncontrollable and intermittent impulse to take alcohol to intoxication, an irresistible impulse, which differs entirely from the physiological state in which an individual merely chooses to indulge in liquor to excess. The first is periodic, the second a daily habit. The first is a *disease*, the latter a *bad habit.* If we in each individual case study up its psychological history, we shall always be enabled to cure.

I knew a very prominent lawyer who, about once in four or five months, would drop his most urgent cases, and remain away from home for days, to gratify the irresistible impulse for drink which periodically seized him, and made him regardless of every consideration of business or family ties. No one deplored this disease more than the patient himself, and no one was more anxious than himself to be cured if such a thing were possible. By my advice, he relinquished his business, put himself under treatment, and at the end of six months returned to his professional duties a well man, and has never suffered from a relapse, as his will power, which had been utterly destroyed, was restored, and he avoided even the most moderate use of alcoholic liquors, and continues to do so to the present day. His dipsomania was the result of a family neurosis, and of hard brain work and consequent brain exhaustion, with too little sleep to renovate his nervous system. I regard this as a case of true periodic mental disorder, just as much as if his disease had been a mania instead of a dipsomania. Dipsomania is not a rare disease in young married women residing amid the excitement of large cities. Nervous exhaustion, produced by sexual excess, and too rapid childbearing, plays, I think, an important *rôle* as the exciting cause of the dipsomania in these cases, which admit of a prompt cure if the patient be removed for a few months from her home, and placed under judicious medical care. If in any given case I can prove to you that an inebriate, who has committed some criminal act during one of his paroxysms, has had a paternal or maternal ancestor in an insane asylum, I certainly present to you a strong reason for pausing before you denounce the act as the simple outgrowth of a vicious habit.

Again, if a man has committed an act prejudicial to himself and others, during a paroxysm of dipsomania which has appeared either in very early youth, or in old age, after a long, virtuous and temperate life, or after a sudden mental shock or sunstroke, I at once negative to your minds the hypothesis of habitual drunkenness.[3]

[3] The profession should understand that this disease menaces, necessarily, not our lowest, but our highest civilization. It is the most brilliant class of men, our great thinkers, men of great mental activity, with whom the anæsthesia attending the use of alcohol blunts and assuages the too acute sensibilities of their nerves. It affords rest to the overtaxed mental faculties, and moderates those excessive sensibilities whose ceaseless activity forces the mind to unresting labor. The men who are threatened with this disease, and become victims to it, are the neurotic thinkers; the men who, from the constitutional debility of their inhibitory nervous faculties, cannot control the limits of their mental activity. My friend, the late Dr. Joseph Parrish, truly said that "the fact that there is a condition of the nervous system with which some men are born, that predisposes them to seek alcoholic indulgence, is too well known to admit of successful contradiction." In an address before the American Association for the Cure of Inebriates, on the "Pathology of Inebriety," I called attention to the fact that it is a disease exhibiting certain essential, psychic and physical signs; a disease in which the victims are all

A very interesting case, from a medico-legal point of view, occurred a short time since, in which the writer was consulted as an expert. A murder was committed by a man under the influence of a small quantity of stimulus, which evidently induced a state of temporary insanity, or an epileptiform attack. The integrity of the brain had been affected by a previous sunstroke, and the man had just recovered from quite a serious illness. It is well known that after a sunstroke, a small quantity of liquor acts very violently upon the central nervous system, and it might, therefore, be argued that he was responsible for the voluntary act by which he submitted himself to the influence of the intoxicating liquors. But the facts of the case were that, previous to this time, he had been accustomed to drink, with impunity, far more than upon this occasion, and had never before been intoxicated. The man was, therefore, in a morbid state produced by the sunstroke, subject thereby to a tendency to insanity, liable to be excited by alcohol, of which morbid state he was ignorant, having had no reason, from his past experience, to believe that such results were likely to proceed from a small quantity of alcohol, and with no intention in his mind to do more than take a very small quantity of stimulus. As you will see, in this case, it seemed the only proper way to hold this man responsible for consequences which an ordinary understanding could recognize as likely to follow from immediate acts. I gave it as my opinion that the murder, which I will presently describe, was committed during a transitory state of *moral epilepsy*, which was the result of a preceding sunstroke, the immediate exciting cause being an attack of illness and the taking of a small quantity of alcoholic stimulus. This state of "moral epilepsy" is a morbid affection of the mind centres, which destroys the healthy coördination of ideas, and occasions a spasmodic or convulsive mental action. The will cannot always restrain, however much it may strive to do so, a morbid idea which has reached a convulsive activity, although there may be all the while a clear consciousness of its morbid nature. The case just alluded to had complained of pains in the head and sleeplessness, which had displayed marked periodicity, and which had been accompanied by great irritability of temper, excited by trifles, and seemingly unconnected with personal antipathies. As has been previously stated, the person alluded to had been suffering from quite a severe illness, and, after taking a small quantity of alcoholic stimulus, went out to walk. He met a friend with whom he had been familiar for years, and a discussion arose as to the respective merits of certain politicians, when, the discussion becoming excited, the man drew a revolver and shot his friend. He then went, in a dazed and confused state, and sat for some hours upon a river dock, and subsequently went home, burst into tears, and informed his wife of the sad occurrence, and gave himself up at the police station. There was no simulation of insanity by pretending to be incoherent or by strange actions, and no attempt, either on the part of himself or wife, to pretend that the act was an insane one. There was, however, a total blank in the prisoner's mind respecting the events immediately preceding the pistol-shot, which shot seemed to have aroused his attention for the time, and he had no recollection of the fact that he sat on the dock for some time afterwards, as he was seen to do. Upon being consulted, as I have stated, I gave it as my opinion that there had existed, for months previous to the occurrence, a profound or affective derangement which, from its marked periodicity, was evidently epileptiform in character, and that the sudden homicidal outburst supplied the interpretation of the previously obscure attacks of sudden derangement. There had evidently been induced by the sunstroke, in this case, an epileptiform neurosis, which had been manifesting itself for months, chiefly by irritability, suspicion, moroseness and perversion of character, with periodic exacerbations of excitement, all foreign to the man previous to the attack of sunstroke. There are a great many instances among dipsomaniacs where, in an unconscious condition, persons progress from odd or eccentric actions to deeds of violence, suicide or murder, being unable to remember the circumstances afterwards, and, therefore, irresponsible for their actions. The question as to the degree of mental responsibility attaching to such cases is one of great interest to psychologists, and also to jurists, and one to which it is hoped, in the future, much more attention may be directed than in the past.[4]

Treatment.—In the treatment of nervous exhaustion and premature mental decay arising as the result of dipsomania, we should primarily direct our attention to the direction of the mental habits. We should endeavor to provide constantly easy and pleasant occupation of the mind, avoiding equally lazy inaction or violent excitement. We have in these cases to deal with a worn, irritable condition of the nervous system—an unstable condition as regards its nutrition, its solidity and its perfection of structure, which makes our task no light matter. We must be very careful that we make our patients sleep, or we shall have a preponderance of waste over repair that will balk all our efforts. Our patients, by reason of the hereditary factor generally present, cannot, without great danger to themselves, do or endure what other

more or less irresponsible, as are the insane; a disease in which the tone and power of the nerve centres is lost—a disease perhaps more than any other, excepting insanity, requiring for its cure time, and long persistent hygienic influences, to restore the normal vaso-motor condition, affecting the nutrition and circulation of the brain and nerve centers. Normal mental function depends upon cerebral cellular health. Dipsomania is eminently a disease depending upon cellular and molecular unhealth, and it is this abnormal condition of the centric nervous system, demanding stimulants, that is essentially the disease. Those who are affected by this disease generally have an inherited neuropathic constitution, and exhibit certain neurasthenic symptoms which are the early, curable, prodromic symptoms of inebriety. They are functional disturbances of the whole bodily organism. There is relaxation of the general muscular tone, cardiac stimulation and palpitation, local tremor, and respecting cerebral actions, the characteristics of debility of brain due to general failure of the normal nutrition appropriating power of the brain, such as morbid fears and dreads, morbidly colored perceptions, conceptions and misconceptions, and a timidity, irresolution and general irritability—all foreign to a healthy person, and constituting the essential psychic signs of the neuropathic conditions of inebriates.

[4] We are very much behind the age in our medico-legal views of inebriety. Mittermaier, in 1860, in the American Jurist for July, has been found enunciating sound and scientific views respecting the legal responsibility of inebriates. Of course it is perfectly evident to any unprejudiced mind, that any disease in which there is abnormal cerebration, and an abeyance of reason and judgment, where the patient is deprived, by disease, of the power of self-control and choice, produces a limited responsibility. The healthy coördination of ideas is destroyed, exactly as in any other phase of mental disease. The late Dr. Beard and Dr. Crothers have preferred the term "trance state" to the condition I have termed "epileptiform," in which a person may be in apparently full possession of his senses, and yet be as unconscious as if in a somnambulistic state.

In true trance, however, volition is lost, and there is complete abeyance of the mental functions. I explain this condition of abnormal psychical process in inebriates, by which intelligence and thought seem temporarily paralyzed, and consciousness suspended, by the sudden establishment of an irritative lesion caused by vascular tonus of the arterioles of both motor and sensory zones of the cerebral cortex, causing such commotion or perturbation of the centres in general that their functions are for the time partially suspended. We get a paralysis or incoördinate action of these movements, special senses and ideas, the centres of which in the brain the lesion invades. Being only functionally suspended, they again resume their functions, and the normal equilibrium is restored, after a variable period of time. Strychnia, in 1-25 to 1-32 gr. doses, is the best physiological antagonist to this state of vascular tonus of the arterioles of the brain in inebriates.

patients might safely do. It will be also necessary to supply the greatest amount of nutritive material to the brain, to repair the undoubtedly existing nutritive lesion. In some cases I have given protagon with good results, and in others the acid phosphates, with free phosphoric acid, in the form devised by Dr. William Pepper, of Philadelphia. It has seemed to me to supply nerve force and to restore enfeebled digestion very excellently in dipsomania. I have also used a preparation of cod-liver oil with the wheat phosphates with good results. We must quiet all abnormal nervous excitability, and keep our patients calm and tranquil. Attention should be paid to the excretory functions of the skin, kidneys and bowels. If there is headache and drowsiness, such diuretics as the liq. ammon. acet., with spt. æth. nitr., are indicated. The ext. of cannabis indica has also proved itself, in my hands, a valuable adjunct, in doses of $\frac{1}{4}$ gr. of the solid extract. Free exposure, without fatigue, to the fresh air, cannot be too strongly insisted upon. One of the most valuable remedial agents is phosphorus, which I prescribe to be administered in cod-liver oil, in doses of from $\frac{1}{100}$ to $\frac{1}{75}$ gr., after meals. The cod-liver oil is one of the best nutritive remedies, as fat must be applied to the nutrition of the nervous system, if this is to be maintained in its organic integrity. The general effects of phosphorus are those of a stimulant, but it possesses a special power over the exhausted nervous system. It is, perhaps, evanescent in its effects, but is never followed by a stage of depression which is noticeable. It should never be ordered on an empty stomach. I have used the phosphorized elixir of calisaya bark with strychnia in many cases of dipsomania with good results. As I have previously remarked, I regard strychnia as a very valuable nerve tonic in dipsomania, as it seems to me to antagonize the effects of alcohol upon the system. Quinine is also very valuable. I have also obtained excellent results from the use of phosphide of zinc, gr. $\frac{1}{10}$, in combination with the ext. of nux vomica, in $\frac{1}{4}$ gr. doses.[5] When there is persistent insomnia, I am accustomed to rely upon the use of prolonged warm baths, given at bedtime, conjoined, when necessary, with the use of the monobromide of camphor, in doses of 4 grs. I always use the imported preparation (Dr. Clin's capsules). This admirable therapeutic agent is one of the most valuable remedies we possess in treating hysterical mania. It should be given in 4-gr. doses, t. i. d., being careful to order the imported article, which comes from Paris. The chloro-phosphide of arsenic (Routh's formula) is a very valuable therapeutic remedy to antagonize the condition of brain-wasting which often threatens our patient suffering from the nervous prostration induced by dipsomania. It should be given in 5-minim doses, after meals, and gradually decreased till, at the end of six weeks, the patient is taking but 1 minim thrice daily, which he can continue for one week more, and then drop entirely. I come finally to speak of the remedial agent which, in my opinion, far surpasses all others in its permanent effects, and which is comparatively little used. I refer to the judicious use of the constant and induced currents of electricity. The essential difference in the action exerted upon the nervous system by the use of electricity and that produced by drugs very often prescribed, is as follows: Many of the remedies commonly employed in the treatment of nervous diseases and in dipsomania, for the purpose of restoring lost nerve force, are *nerve stimulants*, and not nerve tonics in the proper sense of the term.

Electricity is a remedial agent which furnishes us with the means of modifying the nutritive condition of parts deeply situated, and of modifying the circulation to a greater extent, I think, than by any known agent. By the judicious employment of the constant and induced currents, we have it in our power to hasten the process of nerve growth and nerve repair, and thereby indirectly hasten the acquisition of nerve power. The use of electricity does not, I think, act by contributing anything directly to the growth or repair of nerve tissue. Its action, it would seem most probable, is to stimulate and quicken those processes on which the material and functional integrity of the nervous system depends. The action of electricity is always followed, in my practice, by an increase of strength and nerve force, and the results gained are gradual and permanent; while the use of nerve stimulants has always seemed to me to primarily excite the nerve activities proper, and *not* the nutritive processes upon which the acquisition of power depends. The deceptive results obtained from the use of nerve stimulants, depend upon the excitation of nerve activities and the resultant expenditure of nerve power, which is followed by a period of exhaustion, varying in degree and duration.

128 Park Place, near Prospect Park, February 8, 1892.

[5] Oxide of zinc in 2-gr. doses ter die in alcoholic insanity is extremely valuable, inducing healthy molecular action in the brain.

APPENDICITIS.

Read before the Kings County Medical Association, January 12, 1892.

BY W. H. BIGGAM, M.D.,

OF BROOKLYN, N. Y.

So many different terms have been applied to the pathological condition, known and described by more modern writers as appendicitis, that one is apt to have a rather confused idea of the subject.

My remarks will be confined to a brief description of the pathology, diagnosis and treatment of inflammation of the vermiform appendix, and the tissues surrounding and adjacent to that organ under the comprehensive term of appendicitis, which, it seems to me, as fully and accurately expresses the origin of the lesion, and the pathological condition, as does the term salpingitis in referring to inflammation of the Fallopian tubes, but where, as a result of the original lesion, you might have peritonitis, cellutitis, and ovaritis.

So, in appendicitis, you might have following the original lesion, typhlitis or inflammation of the walls of the cæcum; peri-typhlitis, or inflammation of the peritoneum covering the cæcum, or para-typhlitis, inflammation of the peritoneum *behind* the cæcum, all of which almost invariably have their origin in the appendix; and that ulceration and perforation of that organ has been the cause of perityphlitic or circumcæcal abscesses, has been proved by the result of autopsies in the majority of cases.

The late Dr. Henry B. Sands, almost to the time of his death, maintained that where there was a circumscribed collection of pus, the inflammation and suppuration were outside of the peritoneum, and that operation should be deferred ten or twelve days until the abscess had reached a situation where it could be

opened by a simple incision without invading the peritoneal cavity. In the *New York Medical Journal* of February, 1888, he published an elaborate article maintaining his position.

The question as to whether abscesses were intra or extra-peritoneal, was much debated, but there is now no reason for disagreement on this point. Bull and others have demonstrated that the cæcum and appendix are always invested by peritoneum, and to his painstaking labor, with that of Lange, McBurney, Weir, Stimson and Hartley are we indebted for the correction of this erroneous idea.

The cause of appendicitis is commonly supposed to be due to the presence of foreign bodies: fæcal concretions, grape seeds, etc.; but many operations for disease of the appendix have been performed where no foreign body has been found. I can recall two cases that have occurred in my own practice, where no cause could be assigned, except great physical exertion in a cold rain.

If exposure can produce idiopathic peritonitis, why not appendicitis. This would seem a logical sequence in those cases where a catarrhal condition of the cæcum was already present.

A catarrhal inflammation of the mucous lining of the cæcum extending to the appendix, and due to the exceedingly common American malady, constipation, is ascribed by Lange, Gerster and the German school, particularly, to be more frequently the cause of appendicitis, than all others combined.

The diagnosis of this disease is usually not difficult if seen at the beginning, but if the inflammation has extended, and the belly has become tympanitic, it often is exceedingly so. Temperature range is not always to be relied upon; you may have a general septic peritonitis with a subnormal temperature. McBurney says that it is absurd to depend upon the temperature range in these cases, as in any way indicative of the severity of the disease.

Too much importance has been attached to the so-called McBurney point.

Dr. VanderVeer, in a discussion before the State Medical Society at Albany, last year, said there existed no longer any excuse for a physician in full practice who pleaded ignorance of the McBurney point.

The McBurney point, a name given by Dr. Lewis A. Stimson, is, as you all know, a point of greatest tenderness, supposed to be situated two inches to the left of the right anterior superior spinous process, on a line drawn from that point to the umbilicus.

You may find the point of tenderness above, below, to the right or the left of this; as I discovered in a case to which I was called November 18.

In this case the so-called McBurney point was *above* the anterior superior spinous process at the lower margin of the ribs, and as there is another point that I wish to bring out in connection with this case, I will here give a brief history of it:

The patient, G. B., aged 38, was taken sick on the night of November 17 with chills, vomiting and excruciating pains in right iliac region paroxysmal in character.

I saw him on the morning of the 18th and found him lying on his back with the right thigh flexed on the pelvis. His pulse was 88; temperature 100.5. Complained of great pain in right side, which was very tender on pressure; point of greatest tenderness being where I above mentioned. There was slight tumefaction. His temperature steadily rose until on the evening of the 19th it reached 101.4. The pain and tenderness meanwhile increasing. On the morning of the 20th his temperature had suddenly descended to 98.3, where it remained. The pain had gone and the tenderness and tumefaction as rapidly subsided.

I am unable to account for the speedy amelioration of all the symptoms in this case, except that there was a collection of pus in the appendix which found its way into the bowel and so passed off.

Beginning typhoid fever has been taken for appendicitis, likewise an impaction of fæces; a case of which I saw in consultation in the country during the latter part of August last. The patient had been confined to bed five days, with warm poultices to the abdomen, and had been given small doses of opium at regular intervals to relieve the pain.

An ounce of sulphate of magnesia, followed by copious irrigation of the lower bowel, relieved the impaction and cured the appendicitis. But, as the attending physician afterward wrote me, the passage he had astonished the neighborhood.

Exploratory punctures as a means of diagnosis ought *never* to be resorted to. They increase the danger of septic infection, and if the abscess is circumscribed and deeply seated, it is very likely to escape detection.

Of course, if, after exploratory puncture, pus is detected, operation need no longer be deferred; but failure to detect pus ought not to deter one from operating if other good and sufficient reasons present themselves.

This recalls a case in point which I saw in consultation three years ago. The patient was an old lady of 60, who had been having symptoms of appendicitis for ten days. There was a mildly septic condition with some prostration, but no peritonitis. I thought I detected deep fluctuation, and advised operation; but the third physician who was called in consultation advised against it, because after several exploratory punctures he failed to detect pus. I had the pleasure of making an autopsy at the end of a week, and found an extra-peritoneal abscess, that might easily have been reached without invading the peritoneal cavity.

The question of *when* to operate is the most difficult to solve, that presents itself in connection with the disease. Weir forms his opinion as to the necessity of operating by the reaction of the patient to small doses of morphine; that in the majority of cases operation is indicated if large doses of morphine are required to relieve the pain.

McBurney says it is not difficult to determine the existence of the disease, but what is to be the future progress of it *is* very much so, and he is guided, not so much by the number of days or hours the disease has run, but by the character and extent of the inflammation. He favors early operation, not later than the third day, if possible, and on this point at the present time there seems to be a consensus of opinion.

The symptoms of appendicitis at the onset are, in the majority of cases, quite regular. Usually ushered in with a succession of slight chills, followed by elevation of temperature, varying from 99° to 102°.

The bowels may be regular, but there is usually constipation, with an antecedent history of the same. Vomiting frequently precedes the attack. The phy-

sician is called in to relieve the pain, which is a constant accompaniment of beginning appendicitis, and is referred to the lower abdominal region in general, but is greater on the right side. There is tenderness on pressure, generally tumefaction; pulse weak and irritable, running from 100 to 120. Countenance has a characteristic expression of pain, and the patient usually lies on his back with the right leg flexed.

On the affected side there will be a rigidity of the abdominal muscles. This symptom McBurney regards as constant and of much value.

The medicinal treatment of appendicitis can be dismissed in a few words, but before doing so I feel that I cannot too strongly deprecate the giving of opiates in sufficient quantities to quiet the pain. It lulls both the physician and patient into a sense of false security, and ends by putting the patient *eternally* to rest. Such an incident happened to myself not very many years ago, but when I knew less of the disease.

As I then supposed, the first indication to be fulfilled was to relieve the pain, which I accordingly did with full doses of morphia hypodermatically. The case ended in speedy death on the second day, with all the symptoms of rapid fulminant septic peritonitis. Since then I have become convinced that cases which require heroic doses of morphia to relieve the pain require, instead, surgical interference.

There is no objection to small doses of phenacetine, four grains every three or four hours, combined with a quarter of a grain of codeine.

This, with salines in the beginning, dry or moist, warm applications, rest in bed, and liquid nourishment, constitute the medicinal treatment.

With the technique of operative treatment I trust you are all familiar. Those who are interested in that branch of the subject I would refer to an important article by Dr. McBurney, in the New York *Medical Journal* of December, 1889.

An attempt has been made to give you but the barest kind of an epitome of this interesting disease, which is becoming more frequent in proportion as it is better understood and diagnosed by the general practitioner, to which class these rather desultory remarks are particularly addressed.

SOCIETY PROCEEDINGS.

American Electro-Therapeutic Association.

First Annual Meeting of the American Electro-therapeutic Association, held in Philadelphia, September 24, 25 and 26, 1891.

(*Continued from page 236.*)

Thomas W. Poole, M.D., read a paper entitled

SOME SUGGESTIONS AS TO THE MODE OF ACTION OF THE GALVANIC CURRENT IN GYNECOLOGICAL PRACTICE.

The idea generally entertained regarding the use of electricity for medical purposes, is rather of a complex character, combining a blending of stimulative alterative and sedative effects. If this be true it is worth investigating.

Apart from its caustic and electrolytic effects, it is generally believed to exert a trophic or dynamic influence over the tissues through which it passes; but these are too subtile, if they exist, to admit of being traced, at present, with any hope of success. I shall therefore confine myself to consideration as to how the more noticeable vascular effects are produced by the galvanic current.

These are sometimes well seen in the employment of a current of from 50 to 100 milliampères, in cases of chronic inflammatory conditions of the uterus and its appendages, in which pains, tenderness and tumefaction may be readily increased to a notable extent, causing an aggravation of all the symptoms. Even in the absence of any pelvic disease, where the galvanic current is applied to the spine in the treatment of affections of that organ it is not uncommon to find the menses are hastened.

In view of these facts, it must be admitted that the galvanic current, in so far at least as its effects on the female pelvic viscera are concerned, appears to be an excitant, and in some way produces increased hyperæmia and other effects, which at first sight suggest a resemblance to the increased vascularity of the first stage of the inflammatory process;—a resemblance more apparent than real.

How does the galvanic current produce the apparent excitation of vascular action? And again, how does this phase of its character accord with its well earned reputation as a soother of pain and a sedative to excited nerve action?

In view of the well known mechanism by means of vaso-motor centres in the medulla oblongata, spinal cord and elsewhere, for regulating the calibre of the arteries and with this the outflow of blood from them into the veins, the question may be asked, does this general mechanism apply also to the pelvic viscera, or are there special modifications of that mechanism for the control of blood supply to the generative organs in the male and female? This inquiry becomes important, if the uterus and its appendages are to be regarded as erectile organs (Kuss. Phys., p. 492), and if electrization of the genital centre in the lumbar spinal cord or of certain nerves leading from it, produces dilatation of the pelvic arteries, as Dr. Brunton asserts. (Pharmacol., p. 386.)

Such a mode of action would certainly afford a simple and easy explanation of the increased vascularity under consideration: but it would be an irregular and exceptional mode of action, at variance with what occurs in the system generally, in which, under the influence of the electric current we are taught the vaso-motor centres are excited and the arteries correspondingly made to contract.

If we admit the control by these rival claimants, general and local, of pelvic blood supply, we shall have the anomaly of our galvanic current (one pole being in the arteries and the other on the spine), dilating the uterine arteries through the influence of the spinal genital centre, and at the same time the vaso-motor centres in the spine and sympathetic ganglia contracting the same arteries, as they do elsewhere in the body.

Probably there is no danger of such a complication arising, for it is elsewhere stated that Budge, the discoverer of the genito-spinal ganglion referred to, found that when this portion of the spine was faradized there arose energetic contractions of the muscular tissues in the pelvis. Now it is well known that the faradic current, by the rapid vibrations it occasions, determines an increased supply of blood to the part; and this may be the explanation of the observation in question.

Such, no doubt, is the mode of action of the faradic current in cases of uterine relaxation and anæmia, under which the weak or relaxed fibres are exercised and strengthened, the languid circulation quickened, and local nutrition improved; but this does not apply to the employment of the galvanic current in the class of cases under consideration.

Another observation of physiological experimentation must not be lost sight of. It is asserted that "when a sensory nerve is irritated (faradized) the action of the vaso-motor is suspended in the part supplied by the nerve, and in those which immediately adjoin it, so that their vessels become dilated, while at the same time contraction of the

vessels in other parts of the body is produced." (Brunton Pharm., p. 255.) It is unfortunate that in this, as in numerous other instances, physiologists employ the term "vessels" indefinitely, so that it is impossible to know what vessels, whether arterial or nervous, are referred to. For instance, in the condition stated the "vessels" may be the veins, which have become dilated by blood forced into them by increased pressure from the arteries, in a manner to be more fully stated hereafter.

In pursuing this subject further, with a view, if possible, to a more definite elucidation of the action of the galvanic current, I propose to refer to some peculiarities in the relation of this current to involuntary muscles, which appear to have been overlooked by physiologists.

In its relation to the involuntary muscles, including the muscular bands of the arterioles, the electric current applied directly or reflexly to the motor centres and nerves of these muscles, produce effects similar to section of these nerves, or to destruction of their nerve centres.

As regards the arterial muscular bands, in which we are here more especially interested, it will be necessary to summarize the evidence. In doing this I shall quote freely from Dr. Burdon Sanderson's Hand-Book for the Physiological Laboratory, Lindsay & Blackiston, 1873.

What is taught in the text-books is, that when the influence of the chief vaso-motor centre in the medulla is cut off from the vascular system, by destruction of the medulla itself, or by section of the spinal cord, or when the same thing is accomplished locally by section of a vaso-motor nerve trunk, the arteries are paralyzed, relaxed, and permanently dilated. (Hand-Book, 245, 246, etc.)

The student of physiology has just reason to complain of the manner in which facts are half stated. For instance, in a number of sections in this Hand-Book, purporting to furnish scientific proof that the arteries are really relaxed, the condition of the arteries is never alluded to, and we are vaguely informed that "the vessels" are relaxed, without specifying whether these vessels are arteries or veins.

A careful study of the several sections referred to will show that what really occurs, on the destruction of the medulla, or section of the cord, is quite similar to what occurs from defect of oxygen in the blood in the last stage of asphyxia, namely, general contraction of the arteries and the emptying of their contents into the veins.

And now to the proof, which must be condensed and as brief as possible. When a frog is pithed, we are informed (in sections 47 and 85) that the sinus venosus, auricle, and heart, though still beating, are empty. We are not told that the arteries are empty also; but this appears incidentally in the fact that "the intestinal veins are distended," and that "the blood has come to rest in the more capacious venous system out of reach of the influence of the heart" (p. 246). The emptiness of the arteries is further proved by comparison with an unpithed frog, whose nerve centres are still intact. In both frogs the bulb of the aorta is laid open, the frogs being hung vertically on a board side by side. "In the frog deprived of its nerve centres only a few drops of blood escape" from the open aorta, while in the case of the other frog "the bleeding is not only more abundant, but continues for several minutes" (p. 296). Thus the evidence shows that in the pithed frog the arteries, so far from being paralyzed and relaxed, have undergone active contraction, and have emptied their contained blood into the veins, leaving their own tubes empty and the veins greatly distended; while in the other frog, whose nervous centres are uninjured, the arteries contain their usual supply of blood, which drains away through the aortic opening.

The same result occurs when the spinal cord is cut below the medulla. Such forcing forward of the blood from the capacious terminal intestinal veins does not imply that these vessels are under the control of the vaso-motor nerves. Such is not the case. Physiologists invariably limit the distribution of these nerves to the arteries and probably to the capillaries. (Hand-Book, p. 256; Foster's Phys., pp. 263, 265; Brunton's Pharm., p. 254.) Ziegler says "the veins are normally devoid of tomes. The resistance offered to the venous blood current is chiefly due to gravitation, and is chiefly overcome by the action of the muscles." (Path. Anat., p. 45.) The splanchnic nerve trunks contain motor as well as vaso-motor nerve fibres, and it is the action of the faradic current on the former, setting up a rapid series of contractions in the muscles of the intestines and other viscera that the forcing forward of blood from the distended veins of these viscera is due, and not to vaso-motor nerve influence, which, as already stated, has no control over the calibre of the veins, thus the experiment completely fails to prove that the arteries are relaxed and dilated. What it does prove, as in the former experiment, is that the arteries are empty and contracted and the venous system dilated.

Section of the splanchnics affords a striking illustration of the error of the text-books. These nerves contain the vaso-motor trunks for regulating the blood supply of the abdominal viscera. When they are cut, Dr. Burdon Sanderson says, "the vessels of all the abdominal viscera are seen to be dilated. The portal system is filled with blood; the small vessels of the mesentery and those which ramify on the intestines are beautifully injected; the vessels of the kidney are dilated, and the parenchyma is hyperæmic; all of which facts indicate not merely that by the relaxation of the abdominal blood vessels a large portion of the resistance to the heart is annulled, but that a quantity of blood is, so to speak, transferred into the portal system, and thereby as completely discharged from the systemic circulation as if a great internal hæmorrhage had taken place" (p. 260).

It is plain, that here, as in the former cases, the distended "vessels" are the veins and not the arteries; and that there is no proof whatever that the arteries are paralyzed and dilated. Had such been their condition, they could not have "transferred" the blood from the systemic circulation to the portal veins in the manner described. This is not the work of paralyzed and flaccid tubes.

More than this, as already stated above, the veins have no vaso-motor nerves, and their calibre is not, as in the case of the arteries, regulated by nerve influence. (Foster's Phys., p. 263, 265.) All physiologists I believe agree in this. The section of the nerve trunk could not therefore be the immediate cause of the venous enlargement. Considering their passive character, this distension of the veins can only be accounted for by the presence of blood forced into them by the contraction of the arteries.

The classical experiment of Bernard and Brown-Séquard on the cervical sympathetic admits of a similar interpretation. In his original account of it, Dr. Brown-Séquard does not once say that the arteries are dilated. With the usual lack of precision, it is always the blood "vessels" which he found dilated. The effects, he says, are similar to those caused by suspending an animal with the head downward. (Sect. Cent. New Syth., p. 143.) All the facts, including the absence of active inflammatory results (Ch. Sect., p. 90), are consistent with venous hyperæmia.

Again, the results of the destruction of the vaso-motor nerve centre in the medulla as in pithing, is precisely what occurs in the dying and is complete in death from any cause, namely: the well-known arterial symptoms and venous fullness.

Is not the defect of oxygen in the blood, in asphyxia, which also "causes general contraction of the arteries, the immediate consequence of which is to fill the venous sys-

tem" (Hand-book, p. 333), to be held to be paralyzing in its action also? We are told by Dr. Brunton that "the function of nerves depends very greatly upon the quality of the blood supplied to them." (Phar., p. 357.) Dr. M. Foster has stated that in the case of the muscle "bad blood is more injurious than no blood at all" (Phys., p. 126). And we have the "physiological law" of Dr. C. B. Radcliffe, that the "activity of an organ is directly dependent upon its receiving a due supply of oxygenated blood." If it were not for the exigency of the theory of the text books which requires a stimulant to the nerve centres in asphyxia, is it likely that physiologists would have sought for one in so promising a pabulum, as impure venous blood, loaded with carbonic acid, and greatly deficient in oxygen? Having no respect for the theory of the text books in this particular, I venture to claim for the effect witnessed in emptying the arteries and filling the veins, in this case, another example of vaso-motor paralysis and corresponding arterial contraction.

Now the point of all this centres in the fact, that faradization of the medulla, and its chief vaso-motor centre, faradization of the distal end of the cut cord, and faradization of vaso-motor nerves, as in the case of the splanchnics, also causes arterial contraction, general or local, as the case may be. (Hand-book pp. 247, 251, 256, 493.) The same result of arterial contraction follows when the vaso-motor nerve centres are acted on, indirectly, by faradization of a sensory nerve. (Hand-book, p. 254, Brunton's Phar., p. 255.) It is of course in this way that the galvanic current produces its vascular effects in gynecological produce.

To sum up: We have seen that arrest of function of the chief vaso-motor nerve centre by pithing, by section of the cord below the medulla, by section of leading vaso-motor nerve trunks, by paralysis from defect of oxygen in the blood, and in death of the body, produces the uniform effect of contraction of the arteries, and that similar arterial contraction attends the employment of the electric current, directly or reflexly.

If the former series of acts of nerve destruction and nerve section and the causation of death in asphyxia, are to be regarded as paralyzing acts, which surely no one will deny, must we not regard the action of the electric current as also of a paralyzing character?

Having thus arrived at the conclusion that the electric current is a paralyzing agent to the motor nerves of involuntary muscles, and in virtue of its character, as such, produces contraction of the arteries, let us see how this accords with the general effects of this agent in clinical cases.

It certainly accords well with its effect in relieving pain than which Dr. Bartholow has said, nothing in therapeutics is more certain. (Mat. Med., p. 62.) This view of its mode of action justifies the use in our older works on electrical treatment, of such phrases as "the paralyzing effect of the galvanic current" (Meyer's p. 62), "the benumbing effects of faradization;" "one of the most potent of sedatives." (Beard & Rockwell, p. 263, 379, 705.) It also explains the well known electrical anæsthesia during certain minor surgical operations.

It has been claimed that the effect of galvanization in the relief of pain is often due to the improvement of nutrition, and this is doubtless true, but this is a process which requires time, and the relief of pain is sometimes too prompt and immediate to admit of this explanation; and here the "benumbing" character of the action comes into play.

It is easy to show how, in accordance with this very character as a paralyzer, the galvanic current may bring about a quickening of the circulation, with the consequent improved nutrition, absorption of exudations and other beneficial results; thus "from seeming evil still educing good."

We have seen above how frequently arterial contraction, with increased blood pressure, results in forcing the blood from the arteries into the capillaries and veins. The extreme effect seen in the examples cited is not sought, or induced, in clinical cases. What here results, is doubtless a moderate degree of arterial contraction, serving to "tighten" the arterial coats, and as a consequence quickening the blood stream, and thus promoting the desired effects of improved nutrition, etc. That less propelling force is necessary in a tense tube than in a relaxed one, was long ago shown by Dr. C. J. B. Williams, quoted by Dr. W. B. Carpenter, to prove the benefits produced by increased arterial tension in accelerating the movement of the blood (H. Phys., p. 485). We have also other examples which sustain this view. Thus, Dr. Bartholow quotes Spitzka for the observation that the vaso-motor effect of strychnia "is to increase the blood pressure and the rapidity of the blood current by contracting the arterioles." Some therapeutists have attributed similar effects to ergot, and Dr. Bartholow himself finds among the results of atropine (which undoubtedly contracts the arterioles), "an increased supply of blood to the periphery" (Mat. Med., pp. 436, 452, 480).

Let me say in passing, that the effects just attributed to strychnia, namely, contraction of the arterioles, are what might be expected from a drug which "prevents the oxidation of the blood" (Harley); which "directly depresses the motor nerves" (Ringer, Therap., 5th bd., p. 499); and which "destroys nervous excitability from the centre to the periphery" (Dr. W. A. Hammond, Dis. New Syst., p. 539). Strychnia further retards the power of the spinal cord to transmit impressions; it diminishes or abolishes the power of tummation in the cord (Brunton, Pharm., pp. 150, 166), and in all this, proves itself a paralyzer of nerve function, and like other paralyzers, produces arterial contraction, as mentioned above.

From all this, I think we are justified in attributing to electricity, in gynecological practice, the mode of action just described. A moderate effect, quickening the blood stream, accounts for the beneficial effects already enumerated; while an excessive outflow of blood into the veins, especially in the previously congestive and inflammatory cases first mentioned, causes increased pain, tumefaction, and an aggravation of all the symptoms. These, I think, venous hyperæmia is sufficient to account for, seeing the effects are temporary and usually soon subside, unless in aggravated cases.

Further, I respectfully submit, that the effects produced by the electric current upon protoplasm, upon the blood corpuscles, upon the heart of frogs in arresting its pulsations, upon the muscles in inducing the earlier onset of rigor mortis, are all what might be expected from an agent inimical to nervous activity.

I think it is not too much to claim that, had the paralyzing character of electricity over the motor nerves of involuntary muscles been recognized at the time it was seen to stop the frog's heart, the explanation of that result would have been simple and easy. In order that electricity might arrest the heart as a stimulus, it became necessary to assume the existence of a huge and complicated inhibitory system of ganglia and nerves, which are purely imaginary, and wholly unnecessary to an explanation of the phenomena to which they have been applied, and which might be entirely dispensed with to the great advantage of physiological and therapeutic enquiry.

It will be obvious that, if the mode of action of electricity be such as is here portrayed, the use of the terms "excitation," "irritation" and "stimulation," employed in our text-books as synonyms for faradization and galvanization, are manifestly improper, and should be avoided.

As I cannot expect so revolutionary a paper as this to pass without criticism, and perhaps censure, you will permit me

to anticipate probable objection. It may be asked, how even an involuntary muscle can contract without the time-honored "stimulus" from the nerve? The answer is easy. Ever since Haller's time, the independent activity of muscle has been a mooted point. It is now known that the contractile force of muscle is developed in the oxidative process taking place in itself—in short, that the muscle manufactures its own contractile energy, subject to certain nervous conditions (Rosenthal, Muscles and Nerves). It is the failure of this process which causes the relaxation of the muscles in syncope, in extreme alcoholic inebriation, in chloroform narcosis, and other similar states; and also as seen in death before the setting in of rigor mortis.

If you ask why voluntary muscles do not contract also, when their motor nerves are cut, I must confess my inability to answer in a satisfactory manner. There are many things yet to be learned in reference to the mysterious arena where nerve and muscle join their forces. It might be supposed, however, that the motor endings and nerve plates in the muscles may serve in some way to maintain for a time the existing state, after withdrawal of central nerve influence.

Let me add, in conclusion, that if you will give the doctrine here presented a candid consideration, you will find that it accords well with a variety of physiological and pathological conditions, but it would be improper for me to delay you in attempting to discuss them here. I will only say, that it will throw light on what Dr. Francis Anstie said of the vomiting of migraine— that it "marks the lowest stage of nervous depression," the nerve suffering loss of energy, not the gastric muscle, which is active enough. It will show why in strychnia nerve paralysis, the muscles respond to a much weaker current of electricity than in health—in fact, to anything which causes the least nerve perturbation, sometimes even a breath of air; because nervous restraint over the muscle is at so low an ebb that very little suffices to annul it, and to set the muscle free to exert its free and independent contractile power. It will do away with the incubus of inhibition by substituting for it a rational paralysis, under conditions where lessened nerve activity may reasonably and properly be expected.

Gentlemen, I have kept you too long in dealing with a somewhat abstruse subject. I have only now to thank you for the patience with which you have listened to me, and await your verdict. Let me, finally, express the hope, that in some of the well-equipped laboratories of this country, the experiments referred to above will be repeated, under conditions to secure greater certitude and exactness of detail than seems to have been achieved by the eminent physiologists of the Old World.

Dr. Morton: I do not think it right to let a conscientious and carefully prepared paper go by without a word; but I think it is rather a question to be thought out by the physiologist rather than by the doctor. If all the physiologists are wrong, I should invite them here to fight. It is a reversion of our views as to the circulation. I see that the vessels to which the physiologists refer are the capillaries rather than the veins. I do not feel able to fight the physiologist, but I compliment the doctor in the way he handles the facts. I find fault when he says that the faradic current is the sedative, for if I had the toothache I think I should prefer some other current; and although it is somewhat sedative, the others are very much more so. What the doctor quotes of the modern view as regards the muscles is interesting; that it contracts in a variety of substances in the interstices of the muscles, and that finally the very slightest nerve influence may upset the equilibrium of the inter-muscular substance is very interesting. So that when the muscles contract it practically amounts to this, rather than destroying its own substance you excite a destruction of the substance which is stored up there. Practically then, as far as I see or understand the paper, it is that we have been calling exciting effects of the induced current what we should call the paralyzing effects, and I think that is the salient feature which I arose to emphasize, and which I think a most interesting point, and I shall try to think of it again and again as I am using the current and see if anything can be made of it. Sometimes the physiologist and physicist are not right, and the doctors have set them thinking on the right track.

Dr. Walling: I believe, too, that the faradic current has a paralyzing effect. When you approach a nerve, for instance, in facial neuralgia, as in tic, which is very painful, by throwing rapid vibrations on the nerve you so paralyze it that it cannot convey the painful impression, and it gives it time to readjust its disturbed molecules and take on a healthy condition. I have seen that often, and I have come to believe it of a paralyzing nature which you might carry too far.

Dr. Henry McClure, of Norfolk, England, read a paper entitled

ELECTRICAL CONTACT FORCE.

The subject I have chosen for my short paper is contact force at the junction of dissimilar metals or other substances. A definite view of what is going on at such a junction would clear the way to a better understanding of the complex phenomena of electricity.

At the junction begins the work, whether we take dissimilar metals immersed in a fluid, in air, or dissimilar substances or dialectrics brought together. I wish to treat the subject by the light of modern views of electricity with the hope of clearing away some obscurities.

First, it would be well to consider two dissimilar metals—zinc and copper—immersed in a fluid acidulated water; such water contains atoms of oxygen and hydrogen free or potentially free; that is, actually dissociated, or so frequently interchanging at random from molecule to molecule that the direction of their motion may be guided by feeble directive force. Each of these atoms, in a free state, possesses a charge of electricity, the hydrogen a certain amount of positive electricity, the oxygen twice that amount of negative. Zinc and copper both attract oxygen, but zinc more than copper.

The free oxygen atoms begin moving up to the zinc, the free hydrogen atoms to the other plate. It is not necessary to assume that the plates are attracting all the atoms in the liquid far and near. All that is necessary to assume is a force acting on the atoms in the immediate neighborhood of the plates. The zinc plate removes and combines with all the oxygen atoms within its range, but these will be replaced by others by diffusion, these again by more distant ones, and so on. So we have a procession of oxygen atoms all through the liquid towards the zinc. All the atoms which reach the zinc neutralize a certain portion of its electricity by means of the charge they carry, and would so neutralize its attractive power on the charged oxygen atoms and everything would stop; but if the metals are connected by means of a wire, a channel for the escape of its electricity is provided, the circuit is completed, the electricity streams back by the wire, and the procession goes steadily on.

The electricity thus imparted to the copper neutralizes any repulsion it exerted on the charged hydrogen atoms, and makes them in a similar way begin a procession towards it, deliver up their charges to it, combine with each other, and escape as a gas.

Helmholtz avoids the necessity for postulating any chemical (non-electrical) force between zinc and copper by imagining that all substances have a specific attraction for electricity itself, and that zinc exceeds copper and other

common metals in this respect. He would thus think of zinc attracting the oxygen itself, by its electric charge, and so would liken a battery cell still more completely to a voltameter; the polarization at the hydrogen evolving plate he would account for by the attraction of hydrogen for negative electricity, and the consequent repugnance of the hydrogen atoms to part with their charge.

It is almost certain that the hydrogen and oxygen in a water molecule cling together by reason of the attraction between their opposite charges. The atoms in an electrolyte might be likened to charged pith balls driven along by their electric charges.

We must not lose sight of the fact of the two opposite processions. There can be no procession of positive atoms through the liquid without a procession of negative ones. An electric current in a liquid necessarily consists of a flow of positive electricity in one direction, combined with a flow of negative electricity in the opposite direction. If this is proved to occur in a liquid, it is probable it occurs everywhere. It certainly occurs in a Holtz machine while the machine is being turned and the terminals connected; the glass plate acts as a carrier of positive electricity for one half rotation, and negative for the other half, the one travveling forward positively charged, the other backward negatively charged.

Plates of zinc and copper immersed in air are under the same chemical conditions as if they were immersed in water. But on the one hand water is a conductor and air an insulator. Until the plates of zinc and copper are made to touch nothing happens in either case because the chemical tendency is uniform all over both plates; though the attractive power of zinc for oxygen is strong, it would be impossible for it to combine with many atoms, receiving their charges without becoming negatively charged as to repel them electrically as much as it attracts them chemically. But directly metallic contact is effected all the oxygen atoms at this point are swept away and a clear passage is opened from the zinc to the copper for the flow of electricity. (The slight electromotive force at the junction need not be considered at present) an immediate rush of negative electricity from zinc to copper or of opposite way occurs. The copper becomes negatively charged, the zinc positively. So far everything goes on just the same in air as in water.

What follows depends upon the conducting power of air and water. In water you have the atoms of oxygen and hydrogen carrying their charges. In air nothing further happens except the slight electrostatic strain into which the air is thrown by the quantity of electricity accumulated upon the metals.

Sir William Thompson has demonstrated this strain by means of a charged aluminium needle placed near such a junction.

Professor Lodge would almost completely ignore the *volta contact force* and would make the effective cause of the whole phenomenon both in water and air to depend upon the greater affinity of oxygen for zinc rather than copper, and if contact force at all it would be a contact force between metal and air.

True Contact Force.—If an electrical current is passed through a homogeneous piece of metal, heat is produced, this heat being quite independent of the direction of the current and is called irreversible heat. Joule has shown that it is proportional to the square of the current strength. But at a junction of two different substances, or even at a junction of the substances in two different states, as difference of temperature, besides the irreversible heat produced by resistance there is a reversible heat produced, which changes sign with the direction of the current so that the current one way actually tends to cool the junction instead of heating it. This is an important fact in thermo-electricity. There is no doubt that there is something at the junction of the metals helping to propel the current along, doing work, in fact, and consuming its own heat in the process. The vibratory motion in the molecules is getting used up in propelling electricity. More will be said on this subject in considering Rust's theory of thermo-electricity. A reversal of the current produces an extra amount of heat which will be added to the irreversible or frictional generation of heat.

Thermo-Electricity.—Mr. Rust, of Leicester, has shown by a most extended series of experiments with couples composed of soft iron for the first, and zinc-antimony for the second couple, that though the iron is almost four times a better conductor of heat than the zinc-antimony yet the first part of the zinc-antimony is heated before the iron. The explanation is, that zinc-antimony, having fewer atoms, takes up and loses heat sooner, and in such a couple it is not the molecules of the iron swinging in friction or vibratory stress against the zinc-antimony that causes the flow of electricity but it is the molecules of the zinc-antimony swinging in friction or with vibratory stress against the molecules of the iron, and the greater the friction and flow of molecular vibrations we can get into play, so long as there is a continuous flow, and no counter electro-motive force or drag brought about, the greater will be the electro-motive force produced. He compares the molecules of the zinc-antimony and iron to two sets of cog wheels with their cogs interlocking but only vibrating, not revolving. The zinc-antimony, moving the sooner, acts upon the series of iron cogs, therefore the faster and stronger the zinc-antimony cogs run, the greater the friction upon the cogs of the iron, and the greater the electro-motive force produced. In water we saw the two processions of atoms carrying their electric charges; of course such a procession would be impossible here, but one could conceive a charge being passed on from one vibrating or colliding particle to another, each would receive a charge from those behind it and hand it on to those in front of it.

Mr. Rust postulates the following theory of thermo-electricity: "The electro-motive force is proportional to the rate of speed at which heat passes the two *junctions*. He has constructed an electrical furnace which has 6,000 of such small elements, and which gives in actual work an electromotive force of 96 volts, with a resistance of 11.5 ohms. I consider the zinc-antimony in these couples loses its heat soonest by doing work—that is, by propelling the current.

Atoms vibrating about a fixed point drive electricity with them, and will not achieve any propulsion. This might be considered the condition of an ordinary warm solid. But if atoms are made to move faster in one direction than in the reverse direction, moving forward quickly and backward slowly, such moving atoms would propel electricity, the force being greater on the forward journey than on the return. One could conceive the forward vibration propelling positive electricity, the backward negative, as we have seen in the case of the two processions in water, and the two currents in the Holtz machine.

I consider the true contact force at the junction of two dissimilar metals or substances to be of the nature of a static strain; heat in the thermo-couple being the means of breaking down such a strain, and converting static into kinetic electricity. Wherever a static strain is broken down, a current is produced. We see true contact force in insulators as well as in conductors. The striking effects of frictional electricity are due to the same cause, contact of dissimilar substances, and by their contact electricity becomes transferred from one to the other, the violence of friction being mostly necessary to aid the transfer, so that one becomes positive and the other negative. When such a train is broken down,

as in disruptive discharge, a current is produced having electrolytic effects. This has been conclusively shown by Dr. Morton, of New York.

In good conductors such contact forces are feeble, electricity seems to slip through the fingers of a metal, as it were, and the driving force it can exert is weak, while the insulator gets a good grip, and thrusts it along with violence. The metals do not all grip electricity alike. Iron is a metal whose atoms grip positive electricity better than negative electricity; a positive current gets propelled in iron from hot to cold. Copper, on the other hand, acts similarly on negative electricity.

In the foregoing I have laid the works of Professor Lodge and Mr. Rust under heavy contribution.

Dr. Bigelow: Starting out with this long quotation from Hodge, who is pretty well known to some of the members of this Association, it seems to me an endless procession of theories which might be filled up and which would all be required to be substantiated by laboratory and clinical experiments. I do not see but that, brought to its ultimate issue, life itself would be resolved into vibration of ultimate molecules. All the pathological processes would resolve themselves into electricity as to one of the correlative forces of optics and acoustics which are made known to us by the ether of which we know nothing. By the assumption of the ether we know these forces, without it even metaphysical assumption of it is impossible, because these conditions are so interwoven with the physical, and what we know of life is so much a part of the physical that without assuming this it is not convincing. If you go to the metaphysical it is only the assumption of the forces, for we know that human will is a variable force, a variable quantity, and according to researches made at Vienna it has been measured to $16\frac{1}{2}$ feet, and it is a correlative force with electricity, and upon the truth of conservation of forces all these ultimate things will resolve themselves in the same analysis, therefore the question must ultimately resolve itself to a question of the ultimate molecule and potentiality and generation of these conditions.

Dr. Morton: I welcome a paper from our honorary members, and I hope we will have more of them. I am glad to have listened to it, and I think we should give him a good discussion on the subject. I am familiar with some of the authorities brought forward and I sympathize with the direction of his argument, especially in regard to contact electricity, which I have endeavored to make plain by some quotations from the same source from which these were taken.

If there are no further papers before the meeting I think a very happy ending suggested by the last speaker that we have, at least, the ultimate particle, that finest division, as he thinks, of which we can assume, but as he says he shall prepare himself for a further discussion of this subject at our next meeting, I would suggest to him that he pursue the subject further and pass along beyond his ultimate molecule in the regions of the ether and study life and electricity and the great energy of the sun itself.

As Hodge says, the eye is the most delicate organ in the world for testing electricity, meaning that light is electricity, and that the whole region of optics is nothing but a region of electricity, and that the two are so simple in their relations that we have to go back to the mathematical demonstration and admit that light and electricity are one, and that they are only variations in wave length in this endless thing, that great ether whose existence we are bound to admit.

Memorial imparted to the American Society of Electrotherapy, by Dr. Foveau de Courmelles, of Paris, Laureate of the Academy of Medicine, Licencie Es-Sciences Physiques, Licencie Es-Sciences Naturelles, Licencie of Laws L' Rue du Prentemps Malesherbes, Paris:

THE MEDICAMENTAL ELECTROLYSIS.

Galvani, called, at his time, dancing-master for frogs, found the greatest curative way and mechanical strength known to-day. But one is not, with impunity, an innovator and inventor of this world. The happy Galvani, who should have left his name to galvanism, was treated with contempt. He had a successful rival, Volta, from the University of Pavia, who succeeded not in confusing him, but gained also his place in the front row of the electric science. Of the pretended vital force of the former, Volta made the electric fluid, the pile that bears his name and the voltaism.

Before the learned Italians of the end of the eighteenth century, there was only the electrical statics known, the one by rubbing a sulphur bowl between the fingers, like the thunderbolt by de Romas, the abbot Nolles, and Franklin; thanks to their successors electricity was known, no longer in repose, but in activity. They sought and found laws for this displacement, the rules that ruled the phenomena which followed, and their usefulness, both industrial and medical.

One of the applications, the most simple in electricity to the art of curing, is the application on the skin, slightly moistened, of two metals—copper and zinc, for example. If the contact is sufficiently prolonged one obtains burns, with destruction of the tissues. It is, so to speak, a double action—electrical and metallo-therapeutics. We are all impressionable to a metal, which must be found, gold, copper, silver, lead, and which may recover the sensibility annihilated of certain nervous subjects (Burg). By way of retaliation, there exists some metals that are destructive to the organism even by the simple application on the skin; with much more reason this innocuousness is increased if the metal employed brings forth an electric current—otherwise said, if it is a conductor of a rubbing machine, a pile, or a bobbin.

It is again a phenomenon of transport, the fabrication of diamonds owed to Mr. Berthelot; a current passes between two electrodes, one of coal, the other of copper. One discovers on the copper some very small crystals of diamond, and these may use this substance, reputed the hardest and solely useable by itself. In return, the coal is covered by copper. There was then a double transport of one to the other, and *vice versa*. The electrotype gilding and silvering are facts of the same order. I instituted long since a series of experiments to apply to medicine these industrial facts. There are in reality a series of chemical reactions proved by characteristic coloration suddenly appearing; thus: solutions of cyanide of potassium and iron salt separately examined are colorless, but if you bring together one drop of either the blue coloration appears suddenly. I have operated with the currents of galvanic batteries (continuous currents and discontinuous currents) in the following manner: A pullet's skin covering a cyanided paper, the electrodes having been beforehand moistened by a solution, suddenly, through two centimeters in depth, appeared the expected coloration. These phenomenons of transport and penetration by the electric current, the electrical statics (the accumulators) explain the variations of the ordinary electric treatment by the same illness and different patients. The substance of conductors must be varied, which, up to the present, has not been made by any one.

There is the basis of a real medical revolution—the electrical penetration of medicaments. This invention, imparted to the Academy of Sciences the 24th of November, 1890, and the to Academy of Medicine the day after, impassions the physicians at the present day. Since, after my

new experiments, the Academy of Sciences, whose members were M. M. Berthelot, Charcot, and the Baron Larry, and the Academy of Medicine, in consequence of my long memorial, elected the same committee, whose members were M. M. A. Gautier, Gariel, and Boucherdat. Even the title of my method was since copied in London. A lecturer in Lyon's University, Mr. Imbert de la Touche, thinking he had the priority, related to the Electro-Therapeutic Society from Paris experiments of the same kind. The *Lancet* related neuralgias cured by cocaine electrically absorbed. The experiments of M. M. Gautier, Newmann, Lawrence, and Arthur Harries have sanctioned my method with the people of science.

Edison imparted to the Congress of Berlin the fact of a gouty person with nodes cured by dipping his hands, one in a solution of carbonate of lithine, open to the positive pole of a pile, the other in a solution of common salt open to the negative pole. The enthusiasm was great in France after this fact which could be only pure electrolysis destroying the tissues by chemical action, thanks to the electrical act of continuous currents. This dissolution of gouty nodes may have been more rapidly made by the penetration of carbonate of lithium, but would have been produced only by using the electrolysis. This experiment must be accepted with reserve. Besides it is not applicable to the human body, for a man thoroughly immerged in a liquid bath crossed by an electric current is neither penetrated by the liquid of the bath nor by the current, for the latter, which must choose two ways, one say (the liquid's) the other hard (the man's), takes fatally the easier. With two baths for arms the current passes, for having Hobson's choice, it overcomes resistance, closing the circuit. But I regret this method is impracticable for the rest of the organism. This idea put into practice this great while allowed me to dissolve cysts and tumors, and without referring myself as first to the recoveries of patients, I began verifying if the penetration produced itself without the human body. This idea being once proved, I made it practical.

Let us examine the multiplied actions of this method generalized by me. Neither baths nor only application of continuous currents with peculiar electrodes loaded with a substance special for each case. Necessary materials, corsets, probes, trocars, cupping glasses, are built by one of our most eminent professional men, Mr. Chardin. The use, varying according to patients, of several kinds of electricities is made in this manner. All the currents transfer the substances; some continuous; discompose those which are composed, only carrying a part of their elements; the others, discontinous, carry for, and such as they are, the active agents. One distinguishes at once pathological cases to which it would be suitable to apply one or the other of these currents. For tumors, synovial cysts, glands, wens, stone, in fact all abnormal production of local hypertrophy of the organism there are the continuous currents, completed with medical dissolvents, the iodides, the salts of lithium, the bicarbonate of sodium. One understands evidently that if one operated on the skin or in the natural cavities the instrument differs in shape. On the skin a kind of cupping glass helps the electrical penetration of the medicaments by the porosity of the skin produced by a partial gap made in the instrument.

Neuralgia, rheumatisms, hepatic and renal colics, their painful symptoms disappear with the continuous currents descending and the introduction of substances containing opium, aconitine, quinine.

The loss of feeling, muscular atrophy, are destroyed by continuous currents ascending with strengthenings as adjuvants such as strychnine, phosphate of lime, etc.

Paralysis, troubles of the nervous system, normal functions decreased or destroyed, find their master in the discontinuous currents with the introduction in the organism, thanks to them, of tonics or excitants, according to the case. Baths of static electricity with medicamental absorption, electrical descending shower baths are precious adjuvants. This is not a panacea, but a vehicle, a way of transferring medicamental substances.

It is useless to speak of the advantages of this new therapeutic method. With the same, besides the general illnesses on which the action is slow, and must be completed with medicaments absorbed by the mouth, it acts principally on local manifestations. More absorption of nauseous drugs; it is no longer necessary to take them in unequal doses, as neither the digestion nor the circulation requires to be completely saturated before carrying the active agent in infinitesimal quantity to the painful part. Here electricity cures the latter—the penetration is weak but sufficient.

For the stone, not daring to experiment on the human body, I operated in glass.

If a piece of chalk placed in a solution of bicarbonate of sodium is crossed by an electrical current, you see the angles become round, which indicates a destruction of the chalk. This substance being more difficult to destroy than oxalate of lime or urate of sodium, which generally forms the stone. This experience permits one to infer the suppression of painful operations, such as cystotomy or lithotrity. An application made and tried by myself on guinea pigs is based on the following facts: Blunt instruments may perforate the organs. An American had even the audacity to prick the heart with a needle in order to assure himself of the death, and if the patient were not dead, far from killing him, this little operation would resuscitate him. The puncture of pleuritics is also inoffensive, and evacuates the nocuous liquid. They know also that the electrical currents, accompanied with chemical decompositions, kill the microbes. As also, by way of special trocars, of variable dimensions with the cases, one can make pass usefully the electrical medicamental currents; that is to say, cure through the sick organs themselves, perforated for the circumstance. The lungs of the phthisics, in the place of the caverns which are shown by auscultating, are appointed for this treatment. They had often mixed lately, and they mix still, my method, the medicamental electrolysis—double action of electricity and medicament, with the cataphoresis, simple action of transport.

Evidently there is a considerable difference between these two groups of phenomena, the latter being included in the medicamental and electrical actions. In the cataphoresis, you must overcome the resistance of the interposed objects in order to let them pass through the therapeutic substance, as also it is necessary for that to have currents of considerable intensity, dangerous for the patient should there be penetration, or inoffensive without transport, in consequence of insufficient intensity. In my instruments I suppressed resistance of liquids, for a metallic wire of platina carries the current to the contact of the painful part. The active solution is crossed by the current, and arrives also at the seat of the disease. The cataphoresis only utilizes a part of the electrolytic actions, whilst the medicamental electrolysis uses them all.

Let us go now into the clinical province by some typic observance only, reserving to return to them in order to elucidate more thoroughly the question, if it would be necessary.

No. 1. Mrs. J. B., 32 years old. Being attacked by articular rheumatism, great anæmia, frequent syncopes, she cannot be touched on her left knee without crying for pain, and was brought to me in a handbarrow the 15th of September, 1888. Employment of electrodes moistened with following solution: ℞. Benzoas of lithium, iodide of potassium,

bicarbonate of sodium, āā 5 grams; aqua distil.; and continuous descendant currents during one hour, from 15 milliampères in intensity, with 5 piles from Charoin with hydrargyre bisulphas.

The 16th—One may touch the patient's knee.

The 17th—The patient can lean upon her painful leg.

The 18th—She is able to step slowly and the 24th recovered. She walks as well as any one. I since saw her again, she looks upon me as her savior.

No. 2.—Mrs. V. D., 45 years old, being attacked with a uterine fibroma, treated in vain beforehand by the electric current, she presented herself before me the 10th March, 1889. I discompose the iodide of potassium upon the current itself by putting it into the tube open to the negative pole. According to Faraday's rule which rule the electrolysis, the iodine, leading through the positive pole will enter into the tumor; besides I noticed the discomposing action of the negative pole. At the positive, the iodine freely repelled likewise penetrates into the tissues from the abdomen upon which the electrode is applied. One tumor is — centimeters broad. Three months after the uterus a little bigger than natural is only 4 or 5 cubic centimeters in dimension.

No. 3.—Mr. D. F., 71 years old, presents an enlarged prostate gland with dysuria and uræmic symptoms. The sound does pass over (August 20, 1889). It is time of holidays. I don't meet with any surgeon and decide to undertake the over-pubic tapping. I put a soft sound in the hole made by the trocar; the uræmia leaves off, but my patient being threatened by a probable new fall, I electrofy his prostate, the negative pole put in the urethra, receiving iodide of potassium drop by drop, the positive pole put into the rectum and receiving the same solution. The currents are 5 milliampères in strength, their employment during 10 minutes. After 20 sittings only, the patient recovered, and set out for the country.

No. 4.—Mr. Rene Belin, M.D., from Paris sent me successively two gonorrhœic persons who could not be cured by any other treatment, thinking that my method acting locally would only be able to cure them. I applied nitrate of silver in the urethra by positive pole, the negative touching the perineum, during five minutes. The positive electrode modifying the mucous membrane is put on the more painful parts: 5 milliampéres are sufficient, 10 sittings for the first, 12 for the second, are sufficient to the curing. There has the medicamental electrolysis acted as an injection, but made exactly on the painful parts which never happens usually.

No. 5.—Mr. A. B., aged 34 years, left hempilegia in consequence of a phlebitis. The diagnosis was at variance; hysteric hemiplegia, hemiplegia by brain thrombosis. I employ (April 1, 1889), the discontinuous currents with electrodes moistened with strychnine. At first frictions with tincture of nux vomica miscarry, prescribe to erase them. Nevertheless the electric action produces in the arm a medicamental eruption of strychnine, even in one pole the too strong action of the vaso-constrictor produces a local cyanosis during some hours. I have chosen typical cases only, but my treatments were more numerous. I keep them at the service of the American Society of Electro-therapia.

(To be continued.)

THE GERMICIDAL PROPERTIES OF MILK.—Dr. Freudenreich, after a series of experiments on the action of raw milk on bacteria, has come to the conclusion that it possesses remarkable germicidal properties. He claims that the bacillus of cholera in fresh cow's milk dies in an hour; the bacillus of typhoid fever in twenty-four hours, while other germs die at the end of varying periods. He further found that milk exposed to a temperature of 131° F. loses this germicidal property, as does also milk that is four or five days old.

These experiments will set the physicians to thinking very seriously on the advisability of sterilizing milk for infants' food, or for food of adults. We were just congratulating ourselves on the fact that a means of preventing the introduction of disease into the human body through milk, had been discovered in sterilization. According to Dr. Freudenreich, one might conclude, at first thought, that we were mistaken in our expectations and confidence, and that raw milk is, after all, preferable for human consumption. While this view of the case seems reasonable, yet, in our judgment, it should not obtain; for the experiments in question do not indicate that the sterilization of milk should not still continue, and be considered a great source of protection against the germs which may be found in this fluid. In fact, the object of the artificial sterilization of milk is, first, to deprive the milk of its fermentive properties—that is, to destroy the microörganisms that cause it to ferment; and secondly, to destroy the microbes of disease that may accidentally be in them. The first object named is the chief one.

Whatever Dr. Freudenreich may find concerning the microbicide powers of milk upon disease germs, it is evident that raw milk is not a destroyer of all germs which produce irritant or septic poisons. It is only sufficient to let milk stand, and allow all kinds of germs that may, to live at the expense of it, to prove this to any one. Consequently, sterilization is needed to destroy those organisms which milk in its raw condition is unable to destroy, and these are certainly the most common, as well as the most dangerous, of the germs of milk, particularly in infant foods. It is not so much to destroy the germs of typhoid fever, or tuberculosis, or any other disease, that sterilization is recommended, but to destroy germs which cause the transformation of the various substances composing the milk, and create nefarious products. Granted that raw milk is a bactericide of certain disease germs, this does not militate against its sterilization for the other deleterious organisms which it does not destroy. If, for instance, the bacillus of cholera dies in an hour in fresh cow's milk, and the death of the bacillus of typhoid fever occurs at the end of twenty-four hours, artificial sterilization can hasten this destruction, and kill these germs within a few minutes. So, from a practical standpoint, no matter what may be the germicidal property in the milk, it does not follow that one is warranted to depend on it alone for the sterilization of milk.

The demonstration of the experimentalist named has a great scientific value. Showing, as it does, the microbe-killing power of this composition, this experiment proves, or at least indicates, that milk, for a certain time, contains the properties of certain other vital fluids of the body, such as blood-serum, and it also suggests that probably the transmission of certain disease germs from animals to man through raw milk as generally utilized, is, in a measure, prevented by its natural powers. We cannot see that the discovery should in any sense be taken as an indication of a safeguard against individual diseases produced by milk ferments, particularly the various and numerous maladies of the alimentary canal. We would not even consider it a sufficient safeguard against the transmission of such germs as those of typhoid fever, or other pathogenic germs of a similar nature, because frequently milk is drunk very fresh, several hours before the time which it would require to kill them.—*Bacteriological World.*

THE St. Louis Medical College, which was lately made a department of Washington University, is to be housed magnificently. The new building, exclusive of the site, is to cost $107,000.

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SATURDAY, FEBRUARY 27, 1892.

THE PRESENT LEGAL ASPECT OF INEBRIETY AND CRIME.

There are three distinct theories concerning the relation of crime and inebriety, two of which are prominent in the court room, and in all legal circles. The first assumes that inebriety aggravates all crime, that when it is associated with criminal acts it implies greater guilt and culpability.

This is expressed in a sentence, "Drunkenness is no excuse for crime," and repeated is if it was an *infallible truth*. In the practice of the lower courts this is assumed to be highest law, and followed more or less closely according to the judgment of the court. The second theory admits that in certain cases inebriety associated, or acting as a possible cause in crime, may be an insanity. Or more especially a condition, or state of brain disease, in which the nature of the crime or the acts of the person are not understood. As in delirium tremens, or alcoholic convulsions or epilepsy etc. The evidence of the mental condition at the time of the commission may be accepted, as a circumstance in lessening the degree of legal guilt and consequent punishment. In both England and America this theory is now a subject of much discussion. The increasing confusion of judges in regard to crimes committed when under the influence of alcohol, has brought out several long opinions by many authorities. The general conclusion is that it is at present impossible to lay down rules as to what degree of drunkenness can be urged to mitigate punishment; but that it is wise and rational to recognize certain states in which the criminal should not be considered responsible in the same degree as one who did not exhibit these special symptoms. Those who hold the first legal theory to be sound, refuse to accept the second theory of lessened responsibility, and adhere stoutly to what they assert as a fixed principle, "that no inebriety can ever excuse crime."

The third theory declares that inebriety always indicates brain unsoundness, and incapacity of both reasoning and control of acts. That crime committed while under the influence of spirits always implies madness, insanity, and defective control and consciousness of the nature and consequences of the act.

This theory denies the dictum of the first theory, and asserts that no condition of mind or body should be called an excuse for crime, but be considered as a circumstance and factor in determining the punishment or disposition of the criminal. They hold that associate inebriety and criminality indicates a degree of brain degeneration, that requires long years, and perhaps a lifetime, of full legal control and responsibility. They hold that the word punishment implies vengeance and capacity to do otherwise; the latter of which is an assumption of psychological knowledge that is not yet attained. This theory is only occasionally recognized in courts, and is regarded with hostility by the first class, and by the second as only possibly true in certain cases.

Medically, the grave injustice of treating all criminals alike, irrespective of all possible brain states at the time of the commission of the crime, is very apparent. While it is far more rational to consider the nature and circumstances of the criminal and crime, in disposing of the case, it seems irrational to apply means of punishment and remedies that destroy and still further incapacitate the victim for normal living. The recognition of the physical causes of all criminality, and the application of remedies for their removal and correction, is along the line of all advanced science. Courts and judges are always bad teachers of psychological science, and the nature and motives of human conduct. While they often ignore medical science and sneer at medical testimony, they cling to superstitions and absurd theories, that are contradicted by observation and experience everywhere.

RICKETS.

The bane of children artificially fed is malnutrition. Most of the malnutrition of infancy takes the form of rickets. While we are not yet in position to speak authoritatively upon the effect of infantile rickets upon the future adult, we are ready to admit that it probably has some effect, most likely in increasing the individual's tendency to disease, diminishing his resisting power, with possibly playing a powerful *rôle* in putting him into the great class of defectives. The importance, therefore, of detecting the first signs of rickets is apparent. It is too late to be of the best service to make the diagnosis of rickets when advanced bony changes are present. Anybody can make the diagnosis of rickets when the

head is squared, the ribs compressed, the abdomen distended, the wrists and ankles broadened, and the long bones bent. So can anybody passing in the train of a tornado tell what has gone before.

Continuous bowel trouble often leads to rickets; but the earliest sign of the rickets is sweating, particularly at night, and about the back of the head. Next is to be noted a restlessness at night, a desire to remain uncovered, a tendency to convulsive conditions, such as spasmodic croup, or general convulsions; also a tendency to bronchial catarrhs. Some or all of these signs are present before any bony changes become apparent, and they should be the indication for interference. The presence of rickets means that the child has been deprived of some important food element. Usually this is the fat, but not infrequently the proteid constituents of the diet are deficient. When sterilized or boiled or dried milk constitutes the basis of the food, the form of malnutrition is more apt to be of the scorbutic than of the rachitic type. By carefully reviewing the child's dietary the particular deficiency can readily be made out.

By way of treatment, it is first necessary to get the child's stomach and bowels into a normal condition, so that the food administered can be properly digested and absorbed. Then a diet, rich in the elements which had previously been deficient, is to be prescribed. For the infant, proteid food cannot be found outside of milk. But for its fats, not only is milk available, but also cod-liver oil. This latter substance is usually taken readily by young children, and is well borne. BOUCHUT considered it as a specific in rickets, and when it is considered that fat deficiency is so commonly a cause of this disorder, his belief seems well founded.

The indication for the administration of cod-liver oil to the rachitic infant is to be determined entirely by the character of his preceding diet, and not by its present appearance. If the diet has been deficient in fat, fats must now be given it, even if the child itself be excessively fat. The fat of the rachitic baby comes from the excessive amounts of sugar and starch upon which it has been fed, and it seems that the organism, at least the growing organism, requires for its complete nourishment food in the shape of fat, and merely food which it can convert into fat. The use of salt baths is of great importance in the treatment of this disorder. Medication is unquestionably a secondary importance, and hygienic measures are only of value as they improve digestion and assimilation.

BITTEN BY A KATIPO.—It is not long since a fatal result from the sting of the honey-bee was reported from Tivoli, Pennsylvania. This case is spoken of by the editor of *Insect Life*, November, as well-authenticated. The same journal quotes, in the same connection, a statement from a New Zealand paper the serious, but not fatal, effects of a katipo-bite. The subject of this injury was a waterman of the port of Auckland, who went hunting rabbits on the adjacent island of Motutapu. While there he received a bite on the leg from what he states was a katipo, which caused great pain and subsequent œdema. He was taken to the hospital, and it was considered a possible result that an amputation of his leg would be required. The katipo is a riparian spider, black, with red markings, whose name is derived from the Maori language. The animal is known to zoölogists as *latrodectus katipo*. According to the testimony of the natives the bite of this spider has been known to cause death.

NERVE-STRETCHING OF THE SCIATIC NERVE.—Professor Charcot has recently laid before the Societé de Chirurgie three successful cases of stretching of the sciatic nerve. A postman was injured, six years ago, while going his rounds, by a fall from a considerable height, striking upon the right hip. Great pain along the sciatic nerve followed and persisted for four months. It then subsided, to be again very acute about three years later. It resisted all medical treatment, and Charcot resorted to surgical treatment. One month after stretching, all pain had disappeared, never to return. In the second case, that of an artilleryman with a similar history, one operation was followed by the cessation of great pain. The third case was that of a young soldier who suffered from sciatica of an absolutely rebellious nature, and in this patient the operation produced immediate relief. In concluding his remarks, Charcot expressed some surprise that the stretching of nerves has not been more frequently resorted to. He quoted the results of M. Lagrange, who has reported twelve definite cures out of sixty-six cases, forty-nine improvements (permanent or temporary), four wholly unsuccessful cases, and one death.

DR. JONATHAN WRIGHT, Brooklyn, N. Y., has been selected as Vice-Chairman of Section of Laryngology and Otology, for the Detroit meeting of the American Medical Association. Twenty-five papers have already been promised for this Section, and all others wishing to read papers before this Section should at once send title to A. B. Thrasher, Sec'y, Cincinnati.

AMERICAN MEDICAL ASSOCIATION, SECTION ON SURGERY.—The chairman of the Section on Surgery and Anatomy wishes to have it fully understood, that all who may be desirous of presenting papers at the forthcoming meeting in June, should forward the titles of the same at once to the Secretary. For the proper arrangement of the subjects and the assignment of persons to discuss those of special importance, it is essential that the program should be

completed at an early day. J. McFadden Gaston, M.D., Chairman, Atlanta, Ga.; F. W. Mann, M.D., Secretary, Detroit, Mich.

THE death of the Parisian surgeon, M. Louis Alfred Richet, took place December 29, in the 76th year of his age. He was the author of a manual of surgical anatomy which passed through four or more editions. He was surgeon to La Pitié, St. Louis, and other hospitals, also at the Hôtel Dieu. He was decorated with the cross of the Legion of Honor in 1868.

DOMESTIC CORRESPONDENCE.

PHILADELPHIA LETTER.

Dr. Benjamin Lee, Secretary of the State Board of Health and Vital Statistics, has just issued his seventh annual report, which reviews the work done during the past year. It also speaks hopefully of the prospects of obtaining from the present legislature an appropriation sufficiently large to enable some needed reforms to be instituted in the near future, and statutory enactments which will place the work of the Board on a firmer basis, confirm its powers and extend its usefulness. The very valuable services rendered by the State Board during the period succeeding the disastrous flood at Johnstown and other places, was duly recognized by the Executive, and in his message to the legislature, Jan. 5, 1891, Governor Beavor appreciatively referred to this work, and recommended that the authority of the Board be increased and that sufficient means should be placed at their disposal to enable its very important work to be properly and thoroughly done.

The Board has endeavored, but without result hitherto, to obtain from successive legislatures, the passage of a law to prevent the pollution of streams passing from one State to another. It appears, Dr. Lee remarks, to be quite within the limits of probability, that before the State Legislature has another opportunity to vindicate its intelligence in this regard, Congress will have passed a National law, which will, for certain of its waters at least, render further action unnecessary. The importance of guarding the purity of the water-supply has been so insisted upon by sanitarians, that public sentiment has finally been roused on the subject to such a degree that legislature will, before long, be compelled to give attention to this important question. Closely related to this question is that of the disposal of sewage of large communities. Every one who has given any thought to the subject will endorse the statement that drainage of inland cities into neighboring water courses is about the worst method of sewage disposal which could be adopted, and yet it is almost universally resorted to on account of its apparent cheapness. The recent report of the State Board of Health of Massachusetts "On Filtration of Sewage and of Water and Chemical Precipitation of Sewage," constituting a volume of 900 pages, is approvingly mentioned by Dr. Lee, who says that it marks a new era in the discussion of this question. During the past year, small-pox broke out in the interior of the State near Johnsonburg, but it did not spread, owing to prompt action by the Board and the establishment of quarantine and general vaccination. Before the epidemic was checked, however, there had been fourteen cases, eight of which proved fatal. The local health authorities of Philadelphia, Erie and Scranton, by the exercise of like promptness, succeeded in cutting short outbreaks of this disease in their own cities during the year. The cases in Erie and Scranton were directly traceable to the receipt of letters from Texas, where the disease was epidemic, thus showing clearly the necessity for disinfection of the mails under such circumstances. The outbreak in Philadelphia was the result of the presence of an infected steamship in the port, the disease having escaped the observation of the port physician in consequence of the eruption being masked by that of another disease.

Diphtheria has been unusually prevalent both in city and country during the last three months of the year. This is attributable to the free communication between the inhabitants of infected houses, and other persons. In view of the extremely infectious character of this disease, and of the fact that there are numerous instances on record in which bodies dead of it have become centres of infection in districts previously free from it, even train hands having caught the contagion from a corpse in transit, the Board on recommendation of the Secretary, adopted a regulation forbidding absolutely the transportation of the body of a person who has died of diphtheria. Typhoid fever has also prevailed to a greater degree than usual throughout the State, and especially in Bethlehem and in Philadelphia. The indications point to a polluted water supply as the chief cause.

Cases of leprosy appear occasionally in our large cities. The dangerous nature of this most loathsome disease, enhanced by its long period of incubation, makes it absolutely necessary that the United States Government should establish an asylum or colony where such cases may be cared for, and the Board has since adopted a resolution expressing its sense of the expediency of such action. Secretary Lee pointedly says, "There are, no doubt, in every large city, cases in hiding which are slowly developing centres of infection, and which would gladly avail themselves of such a refuge were it open to them. Once in this country, they cannot return to their native land, from the simple fact that no vessel will knowingly take them on board, and their treatment under the present regimé is more than disgraceful, it is simply criminal."

As an important duty of the Board is to disseminate useful sanitary and medical knowledge, it has, for several years, held an annual sanitary convention, which meets in a different part of the State each year, so as to encourage local interest in sanitary legislation, also the collecting of vital statistics, and abatement of nuisances prejudicial to health. Many valuable papers are read at these conferences, and the public press usually ably seconds the work by giving prominence to the proceedings so that the meetings are usually well attended.

One of the most practical features of the work of the Board is the distribution of pamphlets and circulars treating of the preservation of health, the general management of cases of infectious disease, the protection of the public, the care of infants, the best methods of disinfection, the conduct of funerals, etc., written in plain and popular style and with concise and clear practical suggestions. The number of circulars sent out during the past year was 20,508. The Board's expenses for all causes was less than $4,000.

The positive proof which we now possess of the frequent transmission of typhoid and scarlet fevers through the medium of polluted milk, and the extent to which tuberculosis has been found to prevail among milch cows, especially those of the finer, unmixed breeds, are a cause of great anxiety, especially when we contemplate the possibility of the latter becoming a source of tuberculosis in the human subject. The Board of Health has therefore prepared a circular on the sanitary management of herds and dairies for distribution among farmers and dairymen. The largest Alderney milk dealer in Philadelphia, Mr. George Abbott, has very promptly acted upon the suggestion of the Board, and has sent a

circular to city physicians announcing that he has put 44 herds directly under the supervision of responsible veterinarians, who will make frequent inspections of each herd of milch cows, and furnish certificates that those furnishing the milk are free from tuberculosis or other disease affecting the healthfulness as food of the milk, and that the dairy is in good condition. This is an excellent step to take and one that has long been needed; although expensive at the beginning, there is no doubt that this evidence of intelligence and enterprise will prove amply remunerative and lead to increase of business.

At the last meeting of the College of Physicians, H. C. Wood made a personal statement. He had been summoned to New York to give expert testimony in a case of alleged opium poisoning by a medical student, which has recently attracted much attention. Upon reading the newspaper account of his statements in court, he was thunderstruck to find that he was credited with making statements, which he could only account for on the ground that he had suffered with temporary aberration of mind owing to excitement or exhaustion from loss of sleep. He returned to New York at once to see if he might have the case reopened so as to correct any error of statement, such as he found in the published account of the trial. Upon arriving at the office of defendant's counsel, he asked to see the official stenographic report, and his mind was at once relieved by finding that he had been perfectly correct in his statements, but the reporter of the daily paper had been guilty of misrepresentation. What he wished to say about this case was the following:

"The official record of question and answer differs from that published in the newspapers in that it involves a denial of the assertion that I had only one experience in twenty years, and in that the 'yes' of my answer accords with the rest of my testimony in stating that the recorded symptoms did not warrant a conclusion as to the cause of death, whilst the newspaper 'yes' involved the proposition that the girl did not die of opium poisoning.

"I have neither heard nor read the non-medical testimony in the Harris case, and offer no opinion as to the justice of the verdict. I reaffirm, however, the correctness of my evidence that death was not proven by the medical testimony to have been produced by morphine. A very wide study of the subject in laboratory, hospitals, and private practice, and in the literature in the three languages years ago, resulted in my writing:

"'The positive diagnosis of opium poisoning from the symptoms alone is often impossible. In the Harris case the symptoms as embodied in the hypothetical question were so loosely observed that many symptoms essential to the diagnosis are omitted and to this is added the fact that the early development of complete coma as recorded is conformable to natural diseases and is extremely rare, if it ever be present, in opium poisoning. It seems to me that the cause of death, so far as the medical testimony is concerned, is enshrouded in an impenetrable mystery.'"

Prof. W. W. Keen performed an operation of unusual interest at his clinic at Jefferson on the 3d. inst. The patient was a lady thirty years of age, married, and a resident of Brazil, she having been sent to Philadelphia for treatment by her physicians, who recognized the gravity of the case. She had been suffering for about nine months with a rapidly growing sarcoma of the thigh, for which Dr. Keen decided to amputate at the hip joint, and, obtaining her free consent to operate before the class, performed the operation, using Wyeth's method of controlling hæmorrhage by transfixion with large pins and the elastic bandage. The feature in the case of special importance is that the patient was between the fifth and sixth months of pregnancy. She had had three living children and one miscarriage at three months. While pregnant with her last child, about eighteen months ago, she had much swelling of the legs, the left being worse than the right. The swelling diminished after the birth of the child but a lump remained in the left popliteal space. In May, 1891, this became painful, and soon after the tumor began to rapidly increase in size. At the time of the operation it extended from the top of the calf nearly to the groin; the circumference of the lower part of the thigh was twenty-three inches and the tumor was about twelve and a half inches long. The lymphatics of the groin were not enlarged. On account of the rapid growth of the tumor and the effect of the disease upon the general health, it was decided to operate without waiting for the completion of term, and it was not deemed advisable to produce miscarriage. The only operation that could be entertained was amputation at the hip joint. Dr. Keen remarked that it was a happy augury that his predecessors in the surgical clinic of Jefferson College, Profs. S. D. Gross and Joseph Pancoast, had performed this operation five times—Gross three and Pancoast two—with five recoveries. The average mortality in 238 cases, collected by Dr. F. C. Sheppard some years ago, was 87 per cent., military surgery giving 93 per cent., civil practice in traumatic cases 66 per cent., and amputation for pathological causes a mortality of only 40 per cent. So far as the operator is aware, this is the first one on record in which the patient was pregnant. Dr. Wyeth, of New York, was present by invitation, and witnessed this operation, which occupied nearly an hour. Very little blood was lost. Two rubber drains were inserted and thorough asepsis maintained. The temperature of the patient rose to 101° a few hours after operation, but the next day went down to 100°. Now, ten days after the amputation, she appears to be convalescing rapidly, the temperature remaining below 100° since the slight post-operation rise just mentioned. There has been no bad symptom and no interruption in the pregnancy.[1]

At a meeting of the Philadelphia County Medical Society, February 10, a paper on "Metritis as the Initial Lesion in Pelvic Disease; its complications and treatment by Electricity," was read by G. Betton Massey, in which he paid his respects to the laparotomists and their bucketfuls of specimens, claiming that many ovaries and tubes are removed when the real site of the trouble is within the uterus. This position was fortified by reference to a number of cases, seen by him, suffering from post-operative pain, and the opinion was expressed that the diagnoses were vitiated by the examiner frequently mistaking uterine for ovarian tenderness, when pressing deeply into the lateral fornices. He regarded metritis as the most frequent of all the local inflammatory diseases of parous women, and not unfrequently found in virgins, it being either the precedent condition or the nidus of many of the most formidable diseases in this locality. The pathology of the disease was dwelt upon at some length, special emphasis being placed upon the microbic nature of the affection, the initial stage—endometritis—being simply a bacterial colonization of the endometrial gland that, being unconquered by the local phagocytes, resulted in hyperemia, hypersecretion and hyperplasia of the endometrium, extending later by continuity of structure both to the parenchyma of the uterus and the mucous membrane of the tubes. It had been said by an eminent authority that the womb has its natural secretions like the nose. This was admitted by the reader, but he pointed out that the nasal secretion was not normally muco-purulent; as soon as pus corpuscles occur habitually in either secretion the existence of a diseased condition was manifestly proven.

A novel explanation of the etiology of endometritis in vir-

[1] The *Medical News* will shortly publish Dr. Keen's clinical lecture containing the details of this interesting case, and technique of operation.

gins was offered, which was to replace the masturbation theory of Schroeder. This assumed the continual presence of bacteria within the vagina and cervix in all cases except where there is imperforate hymen, the germs being kept in submission and outside the cavity of the uterus by a barrier of sentinel phagocytic cells, those within the cervical cavity in particular preventing intrusion within the glandular cavity beyond the internal os. Weakness on the part of these sentinel cells is the true casual factor of the disease. A girl whose blood is impoverished by inherited weakness, or whose health has been impaired by the many imperfections in our methods of education, is in but a poor condition to marshal sentinels or defenses against any morbific attack. This view is sustained by success of rational methods of treatment of such cases; let the blood-making organs be restored to health and the invaders, if not too deeply intrenched, will be driven out.

For therapeutic purposes, cases of chronic metritis were divided into two classes that resemble the divisions, made by the late Geo. M. Beard, of cases of sexual neurasthenia in the male. In the one class the disease is purely local, the nervous organization of the individual being so robust that it is unaffected by the local disturbance. In the other, slight organic lesion may be associated with profound depression and disorder of the nervous system. It is only of late that the causal relation of uterine disease to these nervous manifestations has been questioned, but of its truth the author had the best of evidence in cases cured only after resort to local treatment. The doubt had probably risen because of a failure to cure by removal of harmless cicatricial tissue from the cervix, and by a lack of neurological training.

As in other subacute microbic affections, the galvanic current offers a typical mode of treating the initial local affection, the author's experience more than confirming the conclusions of Apostoli. The advantages it presented over acids and other cauterants were manifold, some of them being: the possibility of using an elastic application; no piston action, as with the swab; the local effect mensurable and controllable: and the important addition of sorbefacient and muscle-contracting powers. In simple endometritis and hæmorrhagic conditions the positive pole was preferable, owing to its greater antiseptic power; but in the stage of hyperplasia the alternative method was advised. The latter method, or even the faradic current, would act quickly in the subinvolution variety. When the appendages are apparently involved, these methods are to be preceded by a course of vaginal treatment, and the intra-uterine treatment reserved for the facilities offered by a sanitarium, in which the applications are made at the bedside and followed by prolonged rest. Where the nervous system is seriously affected the local treatment should be supplemented by general applications of the faradic or galvanic currents, massage, rest, and overfeeding.

In the general discussion following the reading of this paper there appeared to be a significant decrease in the hostility usually displayed by surgical gynecologists to any mention of electricity in treatment of diseases of intrapelvic viscera.

At the same meeting the President of the society read his annual address, entitled "The Philadelphia County Medical Society in 1848 and 1892." Several other communications were presented.

The new laboratory of hygiene of the University of Pennsylvania, described in a former letter (Vol. xvii, p. 778), will be opened with appropriate ceremony on the 22d inst. A large number of guests have been invited to attend the opening exercises to be held in the library at 3:30 P.M. The programme will be: Prayer by the Rev. Dr. George Dana Boardman; presentation of the new building to the Provost and Trustees by Dr. S. Weir Mitchell, Chairman of the Committee; acceptance on behalf of the Provost and Trustees by Provost Dr. William Pepper; address by Dr. Benjamin Lee, Secretary of the State Board of Health, followed by an address by Dr. John S. Billings, Director of the Institute. The President of the Massachusetts State Board of Health will be present by invitation and deliver an address. The appointments of the new building are as complete as possible, and the course will be at once begun. It is expected that another course will begin about April 2. This school of hygiene has been established largely through the special interest and pecuniary assistance of Mr. H. O. Lea, of Philadelphia, as previously indicated.

The venerable Pennsylvania Hospital is about to be enlarged by a wing on Spruce street, which will, when completed, increase its capacity by over one hundred beds. Plans have already been adopted, and the work will go on at once. The estimated expenditure is over $300,000. It is expected to erect, also, a nurse's building upon the grounds of the hospital, and an out-patient department upon Spruce street, nearly opposite its present location.

The Woman's Medical College of Philadelphia is in a thriving condition, and has a larger class than last year. On the matriculation list are four students from India (one a native), one from Brazil, two from Russia, one from England, one from Canada, with others from distant States—Maine, California, Texas, Mississippi, Georgia, Tennessee, Alabama, Wisconsin, Iowa, and Utah. The total number in attendance is about two hundred. Of the thirty-seven graduates of last May, one, a colored woman, was the first woman of any race to pass the Alabama State Medical Examining Board; another stood first in the competitive examination as Interne at the Philadelphia Hospital. The Young Woman's Christian Association in connection with this college have leased, for a term of years, a house opposite the Woman's Hospital. This building, known as Brinton Hall, contains a reading-room, sleeping apartments, quiz rooms, and a restaurant, for the accommodation of the students of the school. The college building was furnished with fire-escapes during last summer, and has recently been fitted throughout with incandescent lights. Besides the recent election of Prof. Frederick P. Henry to the Chair of Practice, which has been already announced, the appointment of Dr. Harriet E. Lothrop as Demonstrater of Histology deserves more than a passing notice. Dr. Lothrop is a graduate of the University of Zurich, and spent a year in Prof. Klebs' laboratory, so that her qualifications for the position are unsurpassed, and her appointment gives general satisfaction to the friends of the school.

The Trustees of Jefferson College are still considering the question of ways and means in connection with the removal of the college to a more suitable location, which will probbly be on South Broad street.

To the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

I have just seen in THE JOURNAL of January 2, in your report of the proceedings of the Mitchell District Medical Society, the following as purported to have been said by me, in reply to Dr. Wathen's discussion of Dr. Reed's paper. "The speaker said Dr. Wathen had made a statement that should not go unanswered, which was, that all young girls up to 20 of age, who suffered from irregular menstruation, should be examined, looking, he supposed Dr. Wathen meant, for cancer." At the meeting referred to I jocularly referred to some remarks made by Dr. Wathen, but for fear that the interpretation of what I said might be misconstrued, I write to correct the idea that Dr. Wathen meant to convey any such impres-

sion that every young girl up to 20 years of age, should be examined, that suffered from irregular menstruation. Certainly I would not have the impression obtain that I had so misrepresented him. Dr. Wathen is too well known as an authority in diseases of women, for any one to suppose that he would make any such statement as is attributed to him in this report. What was said as a jest at the meeting, appears as a serious statement, in print. Please do me the favor to insert this correction. Yours Respectfully,

J. M. MATHEWS.

Louisville, Ky., Feb. 16, 1892.

Clinical Instruction and the Cook County Hospital.

To the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

An editorial in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION of January 16, 1892, under the caption "Physicians as Politicians," refers to my remarks at a recent banquet of the Practitioners' Club, in regard to the relation—or rather, no relation—of the Cook County Hospital to medical education.

The worthy editor politely introduces me, with a complimentary adjective, as having "directed attention to the fact that in the great Cook County Hospital the teaching of students is absolutely prohibited." He then proceeds to write at large, thus: "and at once entered upon a tirade against politicians and their methods, saying he hated them as he does sin and the evil one." This slighting reference to politics is seized upon as a text from which an editorial opinion is given of gentlemen "who imagine themselves particularly good because they keep aloof from politicians." The sermon, continuing, points out, *ex cathedra*, how the good doctor may, by mixing prayer-meeting solicitations for votes with ward statesmanship, perform a religious duty, as well as open the doors of the hospital.

The above seems to me an honest application of the appeal. The remarks at the Club referred mainly to the shameful position of the hospital in its relation to clinical teaching; and in that connection it was but natural to express one's opinion of politics and its unnaturally close relation to the hospital. It is to clinical work that I wish to take further occasion to refer. "Physicians as politicians," *per se*, could not tempt me to the trouble of a reply; but, in passing, I would say, in explanation of the "evil" allusion, I take no credit for entertaining the highest respect for politics in its ideal significance—the science of government—nor do I think one sounds a pharisaical trumpet if he voices his hatred for the contemptible thing known, by common consent, as politics—the scramble of parties for place, power, and personal ends. A "religious duty" of the doctor is to become a skilful physician. This fully attended to will leave little time to devote to the arduous task of placing himself in harmonious relation to the environment of a medical politician. And the game is not worth the candle. The acquisition is usually earned at the expense of the reputation, practice, and skill of the physician.

But to the chief point: the opening of the doors of the hospital to the medical student. So long as they are in the keeping of "ward statesmen" there is little hope they will be opened, or that the institution will be managed, not in the interest of the managers, but for the welfare of mankind within and beyond its walls. If the fifteen hundred or more physicians of Chicago, and especially those engaged in teaching in the multitudinous colleges and schools, would undertake to demonstrate to the public the inhuman attitude of the hospital towards medical education, they would break with the power of the demagogues and place the institution in proper non-political hands.

Volumes might be written upon the study of medicine. I cannot forbear one remark: the most radical defect in the requirements of the medical colleges is the facility of matriculation. Perhaps the time has arrived when every applicant should bring to his medical studies the degree of B. A., or its equivalent. It certainly is at hand when he should be familiar with such subjects as physics, biology, botany, drawing, English, French, German, and know some Latin and less Greek. The complaint is not only that the would-be student does not bring this necessary knowledge and mental training to the pursuit of a many-sided science and art; but that too often the matriculant exhibits his qualification for the pursuit of an advanced study by his evident unfamiliarity with his native English friends, the three Rs.

In spite of all that was so ably said at the banquet in favor of didactic and laboratory instruction; and the just criticism of the too common farce called clinical teaching, as illustrated by the talking to large classes in the presence of a patient who, for any useful purpose, might be replaced by a "dummy"; the proportion of time given to didactic and clinical instruction should, I think, be so changed that two-thirds to three-fourths of the whole be devoted to the clinical.

In a special report, prepared for the U. S. Bureau of Education by Dr. N. S. Davis, we learn the first permanent general hospital for the sick was established in Philadelphia in 1752, and Dr. Thos. Bond, from the opening of the Institution, introduced his class for bedside instruction. In 1765, the College of Philadelphia, the first in America, required of the candidate for M. B., attendance upon one course of clinical lectures and the practice of the Pennsylvania Hospital for one year, etc. If we deem such an aboriginal college furnishes a poor precedent for clinical work, let us examine its further claim upon us as a worthy guide to this nineteenth century evolution. "If students have not taken a degree in any college, they shall satisfy the trustees and professors concerning their knowledge in the latin tongue, in mathematics and philosophy as shall be judged requisite for a medical education, etc." Now to the moderns: In the announcements at hand of the College of Physicians and Surgeons, and the Chicago Medical College, the former requires, for graduation, attendance upon two full winter courses of hospital, college, and dispensary clinical instruction; the latter, "hospital attendance of at least two terms." The medical teaching in the Continental colleges is, for the most part, clinical in every department. What more evidence is required of the value of clinical study than the practice of the oldest and best, and the prescription of the youngest colleges. The efficiency of any method of education can be best determined by the results. And, if we look for the factor, which, more than any other, has produced the most famous and skilful physicians, it will be found in their intimate connection as students or practitioners with hospital bedside study and practice. The necessity for more extended practical teaching seems to me to require neither argument nor illustration. Since there are not a few who think differently, a further illustration may be allowed. Is the attempt made, for instance, to teach histology by a dissertation upon the laws of optics, the construction of the microscope, and the appearance of cells and tissues; or anatomy, by a description of what may be seen, or of what manner a man is or might be composed, perhaps upon an improved plan? By no means. Then why, pray, so much prating about the knowledge to be gained by inspecting, feeling, listening to and smelling a patient, when the whole descriptive verbiage would not enable the graduate to recognize, say, the subject of small-pox, whom he might meet face to face; while any nurse or mother, who had seen one case, could put to shame the doctor, replete with didactic

precepts, in his attempt at a diagnosis. In short, is not the exercise of the senses more instructive than listening to a description of how to listen, see, touch, taste and smell? True, theory is valuable, but "life is short and art is long," and the economic and scientific method, first, last and always, is fact first, then, to what time remains, theory. All this is an attempt to show that we, as teachers, do require every avenue to clinical teaching to be unbarred. The Cook County is the only hospital, within my knowledge in any country, except Western America, Christian, pagan or agnostic, which does not throw wide open its doors for bedside instruction.

Imagine a stranger (*e. g.*, a Winkle), eager with expectation, who visits its spacious buildings, full of promise and six hundred patients, with a history of two decades, inquiring for its accumulated stores of information contained in its pathological museum, its hospital records and its library, etc. Think of the disenchantment of the seeker of knowledge as the compassionate and sympathizing interne replies: "All the stores you ask for, along with a goodly number of unfortunates, lie buried, and not even tombstones rise to mark the sites." True, during the past four and twenty months, we have erected a few numbered stakes (clinical records). You certainly cannot reside in Chicago, for you have mistaken this place. This is the home, *par excellence*, of politics and politicians, and it is not open for inspection. Their record is too unsavory to offer you, but we keep some very good wines and beer. Cook County Hospital took up its present abode about 1872. From that date until 1878 or 1880, all went merry as a marriage bell. The staff and the internes were allowed the proper privilege of teaching students at the bedside. About the year 1890, the Hospital Board and the late Dr. James Ross, one of the staff, "had a little difference," which resulted in the adoption, by the Board, of a resolution to prevent bedside instruction. That bad precedent stands from year to year unrepealed, and, beyond question, has wrought a thousand-fold more injury to the inmates and humanity, than would have the alleged abuse of privilege which the resolution sought to correct. Physicians and rational men recognize the great advantage of clinical teaching to the cause of medicine, while some rational men seem unable to perceive that it is the *people* who are, in purse and person, sufferers, when prevention and pills are administered by the badly educated and unskilful. The indispensable qualifications of every member of the hospital staff should be eminent ability and a willingness to work. It is an open secret that members, who are not the ablest exponents of the principles and practice of medicine, have, at sundry times, been elected, so that only a fraction of the staff could, under any circumstances, give the kind of instruction to which every student is entitled. The annual election of the Board is the signal for turning topsy-turvy the whole staff, a few only of whom "righten up" for a second year's service; the remainder being kept under by the stronger "grip" of the new men to the skirts of the new board. All too evidently, the political factors are responsible for the fabrication of all the related first-class defects enjoyed by "the Cook County Hospital."

Could the abuses and defects be remedied by purifying politics? No, Mr. Editor. The herculean task of the Augean stables would be in comparison child's play. Were the thing possible, then the millenium! Only 5 per cent. of the inebriates relapse after "the specific" into incoördination, but even the injection of gold is impotent to lessen the appetite or aptitude of certain for crooked ways.

The evils would be lessened by electing the Board for a longer term, thus securing a longer service for the staff, who would thereby be less easily displaced and take a more stable interest in promoting every good work for the hospital. Then, for example, their increased influence might secure sufficient alcoholic extract of the $190,000 annually expended upon the institution, to conserve some such valuable specimens as have gone to waste on account of a discriminating parsimoniousness, or some less excusable reason. The basal requisite for reform involves some method of appointing a non-political board composed of able, large-minded and philanthropic men. The appointment of such might be placed in the hands of the Governor of the State of Illinois, and the term of office be during good behavior. The staff might be elected by the board from the nominees of the various city colleges and schools, and from other nominees of non-school men, such as compose the medical societies. The staff should hold office for life and vacancies be filled from nominations by the staff and election by the hospital board. Such a method would probably guarantee such desiderata as the best care of the patients, the freest and ablest clinical teaching, the advancement of medicine, and the greatest good to the greatest number.

W. Franklin Coleman, M.D.,
Prof. of Ophthalmology Post-Graduate
Medical School of Chicago.

New Mexico for Consumptives.

To the Editor of the Journal of the American Medical Association:

In conformity with my promise, I send you this report. Ever since 1872 I am a resident of the United States, but every other year, and sometimes every year, I take a trip to Europe, where I attend clinics. Three years ago, I had the opportunity of listening to several lectures by some eminent professors in Paris. Their subject was phthisis. After several meetings with some of these gentlemen, I was entertained with a proposition to find a more suitable climate to establish a sanitarium for consumptives, at an altitude of from 4,000 to 5,000 feet above the ocean, not too cold, not too warm, without much rain, neither fog, and especially avoiding snow. The object of finding such a climate, was to permit the patients to be out of doors as much as possible, and even to have them sleep in the open air seven or eight months of the year. In Germany, a great many patients are kept in pine forests, and some of them find relief by the emanations; but lately a great many prominent physicians of all nations found that it was not only the pine emanations, but the pure air which benefited them the most. It was also with the same belief that a French medical society was formed to rescue the consumptive children from that deadly disease.

For over two years I traveled, most of the time in North, Central and South America. I have found a great many good locations, with finest scenery, but almost everywhere there is some objection—either too much moisture in the atmosphere, fog, cold, snow or excessive altitude. After traveling all over the Pacific coast, Nevada, Arizona and Colorado, I had the good fortune to meet with Mr. H. F. Grierson, of the Santa Fe Railroad, and traveling together for several months, we came to see every place of interest in New Mexico, Texas and Old Mexico. In the Territory of New Mexico we found numerous good places, but some rather too cold, some too high altitudes, and others too much snow for certain classes of patients. By gathering a great deal of information from old residents I found malaria existing more or less, all along the Rio Grande, and another objection to the valley is the dust brought by the river, which is so fine as to fly at the smallest breeze; but altogether the best climate, with the most sunshine, is to be found in Southern New Mexico, although some difference must be made on account of the temperature. In fact, I was never satisfied until I found the San Augustine plains,

with an altitude of 4,800 feet above the sea, surrounded by mountains 1,200 to 1,500 feet higher, with unsurpassable drinking-water, and also mineral waters—one spring containing a great quantity of peroxide of iron and manganese, and others containing sulphate of lime, etc., in enormous quantities. But the grandest of all is the level plain, 170 miles long and about 80 miles wide, all covered with palms, cactus, saponaria, Panama plant, soap weed, etc., and every kind of flower all the year round, giving the best opportunity for riding, either horseback or in any kind of vehicle. The temperature is the most even, the thermometer all the year around at an average of about 62°, with scarcely any snow fall, and when it does snow it does not last more than an hour or two; no dust, no malaria, and the soil is the most porous that can be found anywhere.

There are some samples of consumptives, cured, residing here still, who, when they first came here, were not capable of walking alone, and who are enjoying good health ever since. There is a peculiarity in this country. No sooner does any one get there than he feels happy! The amount of rain for three years was an average of about 4 inches a year. Fogs are entirely unknown, and very seldom is there great wind. There is plenty of game of all kinds, good fishing; beautiful shade trees grow at the foot of the mountains. There any patient can sleep out of doors eight months of the year without fear of taking cold. Respectfully yours,

A. PETIN, M.D.,
Commissioner Société Médicale de Paris.

Las Cruces, N. M., November 16, 1891.

SELECTIONS.

THE ACTION OF STRYCHNINE UPON THE CEREBRUM.—It has heretofore almost been regarded as an accepted fact that strychnine has no influence upon the cerebrum, but only upon the gray substance of the spinal cord and medulla oblongata. According to late investigations by Biernacki, this is not correct. After the subcutaneous injection of small doses of nitrate of strychnine on rabbits, the electric excitability of the cerebrum was found to be distinctly lowered. The effect was the same when strichnine was brought directly into contact with the cerebrum. The results of these experiments seem to throw some light upon the curative action of strychnine in cortical epilepsy and other irritative conditions of the cortex cerebri; and they also serve to explain the beneficial effects of this remedy in sleeplessness as recommended by Lauder Brunton. The influence of strychnine upon the nervous system has also been investigated by Paulsen, who finds that large doses cause a general paralysis of the central nervous system.—*Journal of Nervous and Mental Disease.*

ON THE TORSION OF ARTERIES.—In connection with operations for excision of tumors, and other excisions of a like character, Jonathan Hutchinson remarks as follows: "I may mention that for many years I have quite ceased to use any other means for arrest of arterial bleeding than torsion. In excisions of the breast, for instance, I do not think that I have during the last fifteen years ever used a ligature. The torsion is always effected by a pair of Wells' clamp-forceps, now in such universal employment. I am always extremely careful to close all vessels, keeping the wound exposed for a considerable time for that purpose. Very seldom, indeed, have I encountered any secondary hæmorrhage."—*Archives of Surgery.*

THE ACTION OF CHLORAL HYDRATE ON THE KIDNEYS.—Since the publication of Liebriech's monograph on chloral, there has been no study of the action of this remedy on the kidneys sufficient to explain results which had been sometimes noted to follow the use of this valuable hypnotic. Dr. Cavazzini has, however, recently made some experiments in this connection on dogs and guinea pigs, and he has found that when injected into the abdominal cavity, chloral hydrate produces marked irritation of the secreting cells of the kidneys. Even after the first injection it causes visible granular degeneration of the epithelium of the convoluted tubules, while after prolonged administration the epithelium of all renal tubules undergoes degeneration, with the single exception of that of the straight tubes.

In more severe cases it produces swelling of all the renal epithelium, with other symptoms of acute parenchymatous nephritis, although the Malpighian glomeruli are never affected, nor is there ever any implication of the interstitial connective tissue.

The intensity of this destructive process depends partly upon the duration of the poisoning, partly also upon the individual's susceptibility. If the remedy is introduced through the stomach, it may likewise produce degenerative changes, but not to as marked a degree or as rapidly as when it is injected into the peritoneal cavity. The lesions thus described of the renal tissue are stated by the author to disappear after suspension of the use of this drug. Nevertheless, the author states that in none of the cases in which the post-mortem examination proved this condition to be present, did he ever during life succeed in detecting any albuminuria, a fact which will, perhaps, explain the great scarcity of clinical observation pointing to the danger of chloral from its action on the kidneys. The author's observations, however, show that the kidneys are liable to marked disorganization from the action of chloral, and should serve to indicate the necessity for great caution in the employment of chloral in cases where the kidneys are already affected.—*Therapeutic Gazette.*

THE COUCH.—A ROOM IS ONLY HALF FURNISHED WITHOUT ONE.—A room without a couch of some sort is only half furnished. Life is full of ups and downs, and all that saves the sanity of the mentally jaded and physically exhausted fortune fighter is the periodical good cry, and the momentary loss of consciousness on the upstairs lounge, or the old sofa in the sitting-room. There are times when so many of the things that distract us could be straightened out, and the way made clear, if one only had a long comfortable couch, on whose soft bosom he could throw himself, boots and brains, stretch his weary frame, unmindful of tidies and tapestry, close his tired eyes, relax the tension of his muscles, and give his harassed mind a chance. Ten minutes of this soothing narcotic, when the head throbs, the soul yearns for endless, dreamless, eternal rest, would make the vision clear, the nerves steady, the heart light, and the star of hope shine again.

There isn't a doubt that the longing to die is mistaken for the need of a nap. Instead of the immortality of the soul, business men and working women want regular and systematic doses of dozing—and after a mossy bank in the shade of an old oak, that succeeding Junes have converted into a tenement of song birds, there is nothing that can approach a big sofa, or a low, long couch placed in a corner, where tired nature can turn her face to the wall and sleep and doze away the gloom.—*Med. and Surg. Rep.*

THERE are some women of the brunette type, usually with an olive skin, sometimes with a fair skin, who have the misfortune to bear upon their upper lip or on the sides of their face, just in front of their ears, a growth of fine, dark hair. The hair is of the lanugo variety, and is noticeable only on account of its dark color. The application, by means of a camel's-hair brush, of hydrogen peroxide,

will bleach the hairs, and render them invisible except on very close inspection. As a preliminary measure, it is well to wash the growth with a solution of powdered borax in water, to remove the grease which adheres to every hair. The application should be made several times a day until the hairs are thoroughly whitened, and after that as often as is necessary to maintain the color.—*Maryland Medical Journal.*

A Novel Use of a Benzoinol Solution of Menthol.—Dr. Elizabeth N. Bradley has sent us a brief note on the case of a patient, 64 years old, of a rheumatic diathesis, who had been suffering for several days from the pneumonic and cardiac complications of la grippe, when an attack of acute prolapsed hæmorrhoids ensued one night. The usual remedies having proved unavailing, either in alleviating the pain or in overcoming the spasm of the sphincter, it occurred to the doctor that spraying the hæmorrhoids with a benzoinol solution of menthol, which had proved very efficacious in controlling a paretic tendency of the laryngeal muscles in the same case, might so stimulate the muscular structure of the hæmorrhoidal veins as to accomplish a sufficient diminution in the volume of the piles to render them reducible. The spraying of the hæmorrhoids was followed almost instantaneously by a cessation of pain, and by such a decrease in the volume of the tumors that their spontaneous reduction speedily ensued. —*N. Y. Medical Journal.*

The Treatment of Squint by Advancement of the Recti Muscles.—Bronner (*Ophth. Rec.*, July, 1891) bases his opinions on the records of fifty cases of strabismus treated by advancement of one of the recti muscles according to Schweigger's method. He thinks it of the greatest importance that the size and condition of the muscle should be ascertained as nearly as possible before the advancement is performed. In many of the cases, tenotomy of the antagonistic muscle was necessary, and in some tenotomy or advancement had to be done on the muscles of the fellow-eye. In cases of divergent strabismus, tenotomy of the externus and advancement of the internus were necessary. In no case should the same muscle be cut more than once. Bronner thinks that the advancement of the muscle is the best operation in all cases in which the squinting is amblyopic, and in which the angle of deviation measures more than 30°.—*N. Y. Medical Journal.*

The Ophthalmoscopic Appearances in Hypermetropia and their Significance.—Bristowe (*Ophth. Rev.*) considers that the peculiar appearance called the "hypermetropic disc" is found at all ages, and probably continues through life. It in no way interferes with the acuteness of vision, nor damages the usefulness of an eye, nor has it any definite relation to the degree of hypermetropia. An intense "pseudo-neuritis" may be present with a very low degree of error. The "watered-silk" retina exists only in early life, probably in infancy, and disappears with the advent of puberty. The "concentric striation" appears under exactly the same conditions as does the "watered-silk" retina, and like it has no relation either to the acuteness of vision or to the degree of error. He thinks there are two forms of hypermetropia—one where the eyeball is fully formed but has an abnormally small antero-posterior diameter, and another in which the hypermetropia is due to the immature development of the globe and its contents.—*N. Y. Medical Record.*

The Treatment of Blepharospasm.—Allport (*Amer. Jour. of Ophth.*) advises that spasm of the orbicularis muscle be treated systematically by stretching its fibers forcibly. The procedure consists merely in placing a strong, short speculum between the lids, and opening its blades until it is deemed that the muscle has has been thoroughly stretched. The speculum is then firmly set, and allowed to remain in its expanded condition for about five minutes, when it should be removed. The procedure is quite painful, and in some cases may require general anæsthesia. It is often advisable to repeat the operation several times at intervals of a few days.—*N. Y. Medical Record.*

Dr. Nicholas Senn has been invited to address the British Medical Association, at its next meeting, on intestinal obstruction and intestinal anastomosis.

Recent Modifications in Our Views of Enteric Fever and its Treatment.—Since Murchison wrote his classic treatise on enteric fever, we have added almost nothing clinically to the accurate and scientific description he gave of the disease. He covered in that description almost the entire ground in connection with the disease and its history, and in his reasoning as to its etiology he foreshadowed much that bacteriology has since discovered regarding it. In fact, it is only in its bacteriological aspect that any additions have been made to the subject, and it is from this side alone that any additional knowledge is likely to come which can finally determine the mode of its origin. The additional data, however, which we now possess, have considerably narrowed the issues, and enabled us to regard the malady as an acute infective disease, in which, as in phthisis and pneumonia, a special bacillus plays the important part.

Since the typhoid bacillus was discovered by Koch and Eberth, and its peculiarities and mode of growth studied, more especially by the latter observer, our views as to the etiology of the disease have considerably changed, and the time has, I think, now come when, taking account also of the experiments of various other bacteriologists, we may form more definite ideas as to its mode of propagation, its prevalence at particular seasons, and the causation of the symptoms present in its various stages, and therefrom deduce some rational means for treating it.

I shall first refer to the typhoid bacillus and its discovery. In 1880, Koch and Eberth almost simultaneously discovered in the intestines, the mesenteric glands and lymphatics, and especially in the spleen, of patients dying of enteric fever a bacillus, which, though frequently found in the intestines in a form resembling the common *bacterium termo*, induced at particular seasons, or owing to some alteration in the normal vital resistance of the individual, an acutely infective process, infiltrating the adenoid tissue and lymphatics of the intestine; and this was accompanied by the chain of febrile phenomena we designate typhoid or enteric fever. Owing to the difficulty of finding a suitable nutrient medium on which to grow it outside the body, this bacillus could not be differentiated from other bacteria inhabiting the alimentary canal, until Koch succeeded in isolating and growing it on dry gelatine plates; and since then all pathologists are familiar with its appearance and mode of growth. So far all experiments have failed to produce the disease from these cultivations by inoculation; but bearing in mind that it grows both as an ærophyte and as an anaerophyte, it may be innocuous in the former condition and infectious in the latter when in the alimentary canal, whenever the vital resistance of the tissues in that situation is from some reason altered. What may produce these alterations I shall allude to presently. Gaffky, in his observations on this bacillus, has given us some valuable information as to its situation and mode of growth. It is one of the few bacilli found to develop freely in water, and it grows abundantly in milk. He also found it in the soil through which water percolates, and it grows freely in all albuminous media. He also found it to be more abundant in all these media in the autumnal season than in any other; this is a fact of considerable significance. If, however, this bacillus is found so frequently in the food we eat, the water we drink, and in our intestines,

how, we may ask, is it that it does not infect the intestinal glands and produce enteric fever in every case? For we must all take it in at some time or other, if it is not already present in our intestines. With this question I may link two others—why is it we do not constantly suffer from pneumonia when we always carry about with us the germs of the disease in Fränkel's diplococci? And why do we not suffer from circumscribed or diffuse suppurations when the micrococci that produce them are so frequently present in our blood or tissues?

Why we do not, recent investigations on bacteriology have helped to make clear. Bacilli or micrococci are in themselves harmless, whether in the blood or in the tissues, until the vital resistance of some tissue is lowered from either functional alteration or injury, when they readily find therein a suitable soil on which to grow and multiply. It is by this growth and the chemical products generated during the process that the mischief is induced, and the weakening of the tissues around that are most susceptible to their action then affords a further field for the growth of these microörganisms.

Let us first consider in this connection the experiments of a distinguished physiologist, and secondly the course of a fatal disease which clinically we are only lately becoming familiar with, to illustrate my meaning. Professor Kocher, of Berne, produced with a hot iron destructive injury to tissues down even to the marrow of bones, but could not produce septic inflammation so long as the animal experimented on was healthy: but if he lowered the vitality of it by feeding it on putrid matters, permitting thereby septic micrococci to enter its blood, a septic inflammation was at once produced. The other disease I have alluded to in illustration, namely, septic or suppurative endocarditis, arises from either the staphylococcus or streptococcus, when present in the blood from any accidental cause, finding a nidus in an inflamed endocardium or damaged valve; and the chemical products of its growth are then carried by the blood current to set up mischief in other situations, where from anatomical causes or lowered vital resistance the blood and tissues cannot overcome its invasion. The germs of typhoid fever, like all other pathogenic germs, must be regarded as in themselves harmless so long as the tissues with which they are in contact are healthy, else how can we explain the immunity from the disease that exists in healthy individuals who constantly either receive them through food or drink into the alimentary canal or have them normally or constantly resident in that situation?

This brings us to the question of the etiology of the disease. If we take it for granted that the bacillus of Eberth is, by its infiltration of the glandular tissues of the intestine, the cause of all the mischief (and apart from the absence of inoculation evidence most pathologists are agreed that this is so), what are the conditions that favor or produce its acute infection of those tissues?

We have first the evidence that this bacillus is found growing most luxuriantly, and we must presume consequently more virulently and more capable of making a vigorous battle for its existence, in the autumn. But it must find the tissues with which it comes in contact in a weakened condition to get the upper hand in the struggle.

Are the intestines at this period of the year in a more weakly condition than at any other, and if so, from what cause? I think we can answer that question in the affirmative.

Most of us are familiar with the gastro-intestinal troubles that are characteristic of the early autumn months. The gastro-intestinal catarrhs, the catarrhal or autumnal diarrhœas, and the frequent so-called bilious attacks at this season, are familiar to all. How these catarrhs are produced we may readily explain by the rapid fall of temperature in the evenings, after perhaps a warm mid-day, when the action of the skin is suddenly checked and no additional precautions as to clothing are adopted. All hospital physicians are familiar with the sudden onset of bronchial catarrhs at this season, also from the same cause, and with the rapid filling of hospital wards with cases of asthma, emphysema, and fresh broncho-pneumonia in cases the subjects of phthisis during the previous summer and spring. Now let us see if this gastro-enteric catarrh is a usual precursor of enteric fever. Murchison, with that acute power of observation which was characteristic of him, mentions it as a most usual symptom preceding and accompanying the fever in its early stages, and he further adds that catarrhal diarrhœa is frequently present preceding the fever, and that it is often difficult to say whether the disease will remain catarrhal diarrhœa or end in enteric fever. Now, it seems to me that this catarrh, in addition to being brought about by atmospheric changes, or food, may be produced also from the absorption of the chemical products of the typhoid bacilli growing in the intestinal contents, when they are present in large numbers in either food or drink; and that the toxines they thus produce are merely the weapons they use (as Professor Burdon Saunderson expresses it) in their struggle for existence, to weaken the vital resistance of the tissues with which they were in contact and make them fall an easy prey. Why, however, should the glandular tissue be the first overcome in this struggle? The reason seems to me obvious, looking at the matter from a pathological point of view. Adenoid tissue is endowed with a very poor vitality, and has very little power of resistance or of repair when infiltrated or choked from any cause. We see this when it is attacked by a similar microphyte, the tubercle bacillus, whose life-history and power of infiltrating and destroying glandular structures are somewhat similar to those of the typhoid bacillus. The epithelial shedding and proliferation of the mucous membrane which takes place must also weaken the defences against the bacillary invasion. The bacilli find the glandular tissue of the intestine in a condition of derangement from the effects of this catarrh, and it becomes the centre of their habitation.

That this invasion is sudden and followed by rapid changes in the glands there can be no doubt. Murchison, as we know, found infiltration and swelling of the glands in the case of a patient dying on the second day of the disease, and other observers bear similar testimony.

The entire process affecting the gland, so far as the typhoid bacillus is concerned, from the time of invasion to death or disablement of the gland, is over in fourteen days—the normal duration of enteric fever from a pathological point of view. After this period, however, a new set of enemies appear on the scene in the shape of the suppurative micrococci, who, forming colonies on the injured or necrotic tissues around the glands, begin to generate their peculiar toxines, producing the special symptoms and temperature with which we are all familiar after the first fortnight of the disease; so that we may regard enteric fever as the result of the growth in the intestines of two sets of microörganisms. The so-called typhoid bacilli produce the symptoms during the first fortnight, and the suppurative micrococci the characteristic symptoms of its further stages. That other micrococci as well as these latter occasionally infect the patient from the intestinal canal there can be no doubt, and I have at present under my care in the Mater Misericordiæ Hospital a patient with a well-marked attack of erysipelas of the face in the fourth week of his enteric fever.

If recent bacteriological work has enabled us to grasp these facts with regard to the disease, we may ask ourselves what practical deductions are we to draw from them in re-

gard to treatment. Looking at the disease as primarily a catarrhal inflammation of the intestines, and secondarily as one of septic poisoning, our treatment resolves itself into suitable diet and antiseptics. We know already how all-important is the treatment of enteric fever by bland and unirritating diet, such as will be absorbed mainly by the stomach and duodenum, and leave little to be dealt with by the lower part of the small intestine. The medicinal treatment of typhoid by antiseptics has lately received that attention which our more perfect knowledge of its bacterio-logical origin would demand, and we see occasionally in the medical journals glowing accounts of the success of this method of treatment in the hands of some, while others confess that it has not realized their expectations. So far as I myself am concerned, I have used this method of treatment for several years both in hospital and in private practice, and have every reason to be satisfied with the results.

I do not profess to believe that it will abort a case of typhoid once the characteristic fever has begun, but I do assert that it will prevent in the majority of cases the septicæmic phenomena, for it is nothing but septicæmia that we have to deal with after the second week of the fever is passed. The typhoid bacillus has by this time done its work so far as the intestinal glands are concerned, and hereafter we have only saprophytic bacteria and their effects to deal with. The characteristic oscillating type of temperature during the third and subsequent weeks of enteric fever, such as we have in connection with suppurating cavities in the lungs or elsewhere, shows this to be the case.

In seeking for a suitable antiseptic for this purpose, we must choose one which will fulfil the following objects: It must first exercise its effects in the intestinal canal, and not in the stomach. Its action must be thorough, disinfecting not alone the contents of the bowel, but permeating the intestinal wall as well, where septic micrococci may have already established themselves, or even have entered the blood. To fulfil these conditions, the form of antiseptic must be, in my opinion, a gaseous one. We know how readily the intestines absorb gases and pass them into the blood. The antiseptic I am in the habit of using is chlorine in an alkaline solution, as in this form it mingles best with the contents of the intestines, which in enteric fever exhibit a strongly alkaline reaction. This treatment is not new, for Murchison, who expresses himself as in general dissatisfied with antiseptics, speaks favorably of chlorine, and regards it as an admirable means of treatment. He administered it in an acid solution, which in my experience is not so satisfactory. That this treatment produces a fall in the temperature and makes the type of the disease milder, there can be no doubt, and in over a fourth of the cases, when begun early, it brings the febrile process to an end about the fourteenth or sixteenth day.

Murchison, in his careful statistics, found that only seven cases out of two hundred terminated on the fourteenth day by the ordinary method of treatment, so the cessation of the fever by this method of treatment in such a large percentage of cases must be more than a mere coincidence.

It is not claimed for chlorine that it is the best intestinal antiseptic, as more extended experience may enable us to procure a more convenient one; and I hope on some future occasion to bring before the Section the results of my experiments on this subject in conjunction with our bacteriologist at the Materia Misericordiæ Hospital.—*The Practitioner.*

Products of Friedlander's Pneumococcus — Percy F. Frankland, A. Stanley, and W. Frew, follow up (*Trans. of the Chemical Society*, 1891) Brieger's work on the substances formed in the cultivation of Friedländer's pneumococcus. Brieger found that on growing this microörganism in solutions of grape or cane sugar he obtained acetic acid with some formic acid and ethyl alcohol. The results of these further experiments are summarized as follows: 1. The pneumococcus of Friedländer sets up a fermentative process in suitable solutions of dextrose, cane sugar, milk sugar, maltose, raffinose, dextrin, and mannitol. 2. It does not ferment solutions of dulcitol or glycerol, and has thus the power, like the bacillus ethaceticus, of distinguishing between the isomers mannitol and dulcitol. 3. In the fermentation of dextrose and mannitol, the principal products are ethyl alcohol and acetic acid with a smaller proportion of formic acid and traces of a fixed acid—in all probability succinic acid. The gaseous products are carbonic anhydride and hydrogen. The authors give equations and approximate molecular proportions.—*Brit. Med. Journal.*

Note on the Bronchitis of Influenza.—The great pandemic of 1889-90, by its sudden appearance and rapid extension at a time when influenza had almost become a forgotten disease, took the medical world by surprise as if it were a new and unheard-of occurrence. In spite, therefore, of the enormous abundance of material for observation, our ideas as to its etiology, pathology, and treatment only began to become clear after the first stress of the visitation was past. And although even now we are far from an exact knowledge of this important disease, we have at least obtained a number of valuable data concerning it, from which we may hope to proceed to its elucidation.

The only value of the following notes, derived from personal observation, lies in the fact that they indicate a certain uniformity in the phenomena presented by a series of patients of various ages and constitutional types, and allow us to form a fairly definite clinical picture of one variety of the affection.

A few general remarks may be permitted by way of introduction. It is generally agreed that, at least in Vienna, we have not had to do with a distinctively epidemic wave of influenza, but rather with a number of sporadic cases, a smouldering and scattered outbreak of the once virulent pandemic. Grave respiratory complications were likewise observed only in occasional instances, so that we may fairly describe the disease, up to the present at any rate, as sporadic and benign.

To deal first with the meteorological characters of the year 1890-91, a winter of keen frost and deep snow was followed by a cold rainy spring and a cloudy thunderous summer. The autumn and fall of the year were abnormally mild, with unusually little rainfall, but marked by dense fogs. Only towards the middle of December did rain and snow fall in any quantity,and it was then that a fairly numerous series of influenza cases were first reported.

Without giving entire adherence to the prevailing classification of the morbid types of influenza, we are probably justified in speaking of one of them as the catarrhal-gastric form. The cases here summarized were of this form, were nearly simultaneous, and followed a remarkable uniform course. The disorder began in all cases with a feeling of lassitude and depression, similar to that of coryza. No rigors were noted. The fever lasted from one to three days, and was not of much intensity. No instances of intense nervous prostration occurred. Generally speaking, the symptoms were not such as to cause special anxiety. The respiratory phenomena were, however, characteristic. All the patients complained of a sensation of dryness in the pharynx, with intensely irritating cough. The attacks began almost invariably with violent hawking, followed by a number of short, noisy coughs, often so intense as to suggest the paroxysms of whooping-cough. In spite of vehement efforts, the expectoration was either *nil* or consisted of

small lumps of viscid white or yellowish mucus, mingled as a rule with a good deal of saliva. Auscultation revealed either mere harsh vesicular breathing or sonorous rhonchi: over the lower lobe on both sides scanty bubbling *râles* could be heard. One case, that of a man aged 53, is of special interest. He had suffered for years from chronic bronchitis of moderate intensity. The attacks, before the present illness, had always been accompanied by easy and somewhat copious expectoration, but on this occasion the bronchial affection took on the characters just described. It was this case which led us to regard the clinical variety we have set forth as a specific one, distinct from ordinary bronchitis—a specific influenzal bronchitis of mild type. It must be added that all the patients, after defervescence, or even during the pyrexial period, complained of an intense feeling of chilliness.

With reference to the digestive tract, loss of appetite and a tendency to constipation were usual, but they were not of long duration.

In the matter of therapeutics, the recent antipyretics exerted but little influence, while a more local treatment of the bronchitis, by warm mucilaginous drinks, inhalations of salt-water vapour, pumiline, and the like, procured at least alleviation of the symptoms. Of narcotics, codeine seemed to be of some value in doses of 0.3 to 0.6 grains *per diem*. In general, however, it must be admitted that remedies appeared to effect but little the dragging course of the disease. —*The Practitioner*.

Verbatim answers to the following questions in an examination before the Minnesota State Board of Medical Examiners.

Obstetrics.

1. Describe the stages of natural labor.
2. Give duties of attending physician in a case of normal parturition.
3. Give anatomy and physiology of the placenta.
4. What are the indications for the use of the forceps?
5. Give causes and treatment of post partum hæmorrhage.
6. What treatment would you adopt in puerperal eclampsia.
7. Describe steps in the performance of podalic version.
8. Give treatment for vomiting of pregnancy.
9. Describe steps of operation in making Cæsarian section.
10. Give treatment in mastitis.

ANSWERS.

1. Proper dilation of the os. Regular and stated labor pains. Head presentation.
2. Strict attention to all detail *pre*taining to the case.
3. A thick muscular substance enveloping the fetis containing the liquor or water. The body through which the fetis receives sustanance and life through the mother.
4. Forceps are seldom required. They may be required in obstruction of head passing through arch or in enlargement of the head or in some formes of malformations of the head.
5. In post-partum hæmorrhage give digitalis and tonics.
6. Had I a case of the kind I would send for another physician.
7. I would proceed as in turning and deliver by the feet.
8. Keep patient quiet. Give small pieces of ice to be slowly dissolved in the mouth and give fluid extract of black haw.
9. Make shure the case first is one that requires an operation of the kind to be made. Prepare antiseptic and proceed as per instructions laid down in the books.
10. In mastitis use fomentations and give tonics.

10, By another candidate:

Mastitis or inflammation of the mastoid cells occurs sometimes from pressure of delivery, from cold draughts of air soon afterwards and numerous other causes, foreign bodies in the ear, etc. If abscess follow it may break and perforated the onum permanateal but not always. It may work under the mastoid process and the temporal bone and discharge.

MISCELLANY.

THE MICHIGAN STATE MEDICAL SOCIETY announces that its twenty-seventh annual meeting will be held at Flint, on Thursday and Friday, May 5 and 6, 1892. The value of effective professional organization is too apparent to need further comment. The Society now has a membership of over five hundred, and its meetings are always well attended. Its scientific work is divided into three sections, in each of which papers of interest and value are presented. At each meeting there are also four annual addresses: The President's address, Dr. Geo. E. Ranney, Lansing; address of the Orator of the Section on Practice of Medicine, Dr. H. B. Baker, Lansing; address of the Orator of the Section on Surgery, Dr. C. B. Nancrede, Ann Arbor; address of the Orator of the Section on Obstetrics and Gynecology, Dr. A. W. Alvord, Battle Creek. Secretaries of Sections: Surgery, Dr. F. W. Mann, 250 Fort street, west, Detroit; Practice of Medicine, Dr. J. B. Bradley, Eaton Rapids; Obstetrics and Gynecology, Dr. A. W. Imrie, 439 Woodward avenue, Detroit. Titles of papers to be read must be in the hands of the General Secretary by April 15, or they cannot appear on the programme. Executive Committee: A. A. Thompson, Chairman, Flint; J. C. Willson, Flint; B. Cogshall, Flint; G. V. Chamberlain, Flint; L. N. Beagle, Flint. Geo. E. Ranney, M. D., President, Lansing. Chas. W. Hitchcock, M. D., General Secretary, 43 Henry street, Detroit.

THE FORTY-THIRD ANNUAL SESSION of the Medical Association of Georgia will meet in Columbus, Ga., on April 20, 21, 22. The officers are: President, G. W. Mulligan, M.D., of Atlanta, Ga.; Vice-Presidents, James M. Huli, M.D., of Augusta, Mark H. O'Daniel, M.D., of Macon; Treasurer, E. C. Goodrich, M.D., of Augusta; Secretary, Dan H. Howell, M.D., of Atlanta, Ga.

I LEAVE the State at once on account of ill-health, and all matters pertaining to the Iowa State Medical Society will be attended to by Dr. J. W. Cokenower, 523 West Walnut St., Des Moines, who has assumed the duties of Acting Secretary, and to whom all letters and exchanges should be sent.
Respectfully, C. F. DARNALL,
Sec. Iowa State Medical Society.
West Union, Ia., Feb. 22, 1892.

NEW GENITO-URINARY JOURNAL.—A monthly publication has been issued at Paris, called *Le Chirurgie Moderne des Organes Génito-urinaires*. It will be edited by Dr. J. Lavaux.

THE United States Supreme Court has lately decided that a court has not the right in a civil case to order a medical examination of a person against his or her will.

MORE than four thousand students are gathered at Ann Arbor, Michigan. Beyond a doubt this is the largest collection of students in one town in America.

THE Medical Society of the County of Kings, New York, has endorsed the Pan-American Medical Congress, and appointed the following committee to coöperate with its officers: Dr. J. H. Raymond, Chairman, and Drs. Alex. J. C. Skene and Alexander Hutchins.

OFFICIAL LIST OF CHANGES in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from February 13, 1892, to February 19, 1892.

Capt. Walter W. R. Fisher, Asst. Surgeon U. S. A., leave of absence granted is extended fifteen days.

First Lieut. James D. Glennan, Asst. Surgeon U. S. A., leave of absence granted on surgeon's certificate of disability is extended fifteen days.